GROUNDWATER MONITORING PROGRAM
2018 QUARTER ONE STATUS REPORT
FOR
REMEDIAL ACTION AT
THE DEFENSE NATIONAL STOCKPILE CENTER SCOTIA DEPOT
GLENVILLE, NEW YORK

Prepared For:

U.S. Army Corps of Engineers

Prepared By:

AECOM

AECOM Technical Services

June 2018

GROUNDWATER MONITORING PROGRAM
2018 QUARTER ONE STATUS REPORT

FOR

REMEDIAL ACTION AT
THE DEFENSE NATIONAL STOCKPILE CENTER SCOTIA DEPOT
GLENVILLE, NEW YORK

Prepared For:

U.S. Army Corp of Engineers

Prepared By:

AECOM

Contract No. W912DY-09-D-0059

Task Order No. 0010

June 2018

Table of Contents

1 INTRODUCTION 1-1

1.1 Site Description 1-1

1.2 Site History 1-1

1.2.1 Summary of Previous Investigations 1-2

1.2.2 Pre-Design Groundwater Investigation – 2013 1-3

1.2.3 Baseline Groundwater Investigation 1-3

1.3 PRB Design Summary 1-4

1.4 Remedial Action Implementation 1-4

2 QUARTERLY GROUNDWATER MONITORING PROGRAM 2-5

2.1 Sample Collection Methods 2-6

3 RESULTS 3-1

3.1 Hydrogeologic Results 3-1

3.2 Groundwater MNA Parameter Results 3-2

3.3 Groundwater VOC results 3-2

4 SUMMARY AND CONCLUSIONS 4-1

5 REFERENCES 5-1

List of Figures

Figure 1-1 Site Location Map

Figure 1-2 Site Layout Map

Figure 2-1A Compliance Wells and PRB Profile – March 2018

Figure 2-1B Groundwater Profile Section B-B' – March 2018

Figure 3-1 Potentiometric Site Map –March 2018

Figure 3-2 Groundwater Results – Quarterly Monitoring Locations – March 2018

List of Tables

Table 2-1 Location of Monitoring Wells

Table 2-2 Monitoring Well Sampling Schedule and Guidelines

Table 3-1 Groundwater Elevation Data – March 2018

Table 3-2 Compliance Well Pairs Groundwater Sample Results - March 2018

List of Appendices

Appendix A Groundwater Sample Collection Field Forms

Appendix B Field Calibration Forms

Appendix C Hydraulic Gradient and Velocity Calculations

Appendix D Full Laboratory Analytical Results

Appendix E AECOM Data Usability Summary Report (DUSR)

Appendix F Groundwater Concentration Trend Plots

1 INTRODUCTION

This report has been prepared by AECOM on behalf of the United States Army Corps of Engineers (USACE) and the United States General Services Administration (GSA) to document the groundwater monitoring activities performed at the Former Scotia Navy Depot (FSND) (Site) for the first quarter of 2018 (March 12, 2018, through March 15, 2018). This report presents the results of the sixth groundwater sampling event after the completion of the construction of the zero valent iron (ZVI) permeable reactive barrier (PRB) which was installed across the volatile organic compound (VOC) plume to remediate groundwater at the Site. This groundwater sampling event was a Site-wide sampling event which included collection of groundwater samples from 12 monitoring wells. Installation of the PRB was completed in from February 2016 to December 2016. The Site is adjacent to the north side of New York State (NYS) Route 5 (Amsterdam Road) in the Town of Glenville, Schenectady County, New York. A Site location map is provided in Figure 1-1.

1.1 Site Description

The Site and adjacent properties are zoned for commercial use. Residential properties are located to the south between Amsterdam Road and the Mohawk River. The Mohawk River is located approximately 1,500 feet west-southwest of the Site and represents the major drainage feature in Schenectady County. The water table beneath the Site is approximately 65 feet below ground surface (bgs), and groundwater beneath the Site flows from northeast to southwest toward the Mohawk River.

The Site overlies a United States Environmental Protection Agency (US EPA) designated Sole Source Aquifer referred to as the Schenectady or Great Flats Aquifer system, which is adjacent to and extends beneath the Mohawk River over a distance of approximately 12 miles in Schenectady County. Relative to a series of four aquifer protection zones established to protect five municipal water supplies relying on the aquifer system, the Site lies in Zone III or the General Aquifer Recharge Area. The Site is located approximately 1,500 feet southwest of the Village of Scotia well field and approximately 1.25 miles north of the Town of Rotterdam and City of Schenectady well fields.

Portions of the original Scotia Naval Depot have been subdivided and sold since 1972 by the United States Government. The Site now consists of several large privately held parcels in addition to a portion of land still administered by the GSA. The private parcels contain a variety of industrial tenants; while the GSA leases its remaining portion to the Defense Logistics Agency/Defense National Stockpile Center and the Navy.

1.2 Site History

The Scotia Depot was built in 1942 and 1943 and was commissioned as a United States Navy facility on March 30, 1943. It served as a storage and supply depot for naval forces along the Atlantic coast and Europe, and as a storage and distribution point for National Stockpile materials. On January 1, 1960, the Navy turned the facility over to the GSA. During the period between early 1966 and approximately 1973, the USACE/Army Material Command (AMC) leased buildings from the Navy for the fabrication and storage of vehicles as well as other

military equipment. Additionally, between 1967 and 1969, the GSA and the Navy leased to the United States Army/Defense Supply Agency, Buildings 202 and 203. The agreement indicates these buildings were used for the preservation and rail loading of trucks; and storage of trucks and vehicles.

1.2.1 Summary of Previous Investigations

In the late 1980s, trichloroethene (TCE) was detected at low-level concentrations of less than 1 microgram per liter (µg/L) in the Town of Rotterdam and City of Schenectady well fields. In an effort to determine the potential source(s) of the TCE, the New York State Department of Health (NYSDOH) performed sampling of private water supply wells in the area during 1991. The private water supply sampling included residences located on NYS Route 5 in the Town of Glenville hydraulically downgradient of the Defense National Stockpile Center Scotia Depot Site. VOCs, including TCE, 1,1,1-trichloroethane (1,1,1-TCA), and tetrachloroethene (PCE), were detected in groundwater collected in some of these residential wells. The sampling results were consistent with the known groundwater contamination concentrations at the Defense National Stockpile Center Scotia Depot Site, including TCE which was detected in the NYS Route 5 residential well water samples at concentrations up to 320 µg/L. Following a recommendation by the NYSDOH to connect to public water, the homes on NYS Route 5 were subsequently connected to public water provided by the Town of Glenville. Although the drinking water standard was never exceeded in the City of Schenectady and the Town of Rotterdam municipal water supply wells, increased groundwater quality monitoring was initiated following the identification of the contamination.

Subsequent to the NYSDOH residential groundwater sampling, six subsurface investigations were completed to identify the possible source of TCE in the residential wells and to delineate the extent of the TCE groundwater plume. The investigations were completed between 1995 and 2007 and focused on the assemblage of properties comprising the former 337-acre Defense National Stockpile Center Scotia Depot. The New York State Department of Environmental Conservation (NYSDEC) 2007 Expanded Site Investigation (ESI) (NYSDEC, 2007) provides details on each of these investigations. Investigation data indicated that TCE disposal may have also occurred in the northeast corner of the 401 sub-block and the area near the north corner of the 403 sub-block.

Based on these investigations, a Record of Decision (ROD) specifying a groundwater remedy was approved by the NYSDEC in March 2010 (NYSDEC, 2010). The ROD specified a remedial action for the groundwater plume which included treatment of the plume through the installation of a zero valent iron (ZVI) PRB. During this time investigations were also conducted in relation to a carbon tetrachloride plume that was identified as a source for potential soil vapor intrusion. In addition to the groundwater remedy, the ROD also identified the need for soil vapor intrusion mitigation at the building 201 sub-block. Details on the installation and monitoring of the SVI portion of the remedy are provided in the Final Engineering Report (FER) (AECOM, 2017a). A Site Layout Map is provided in Figure 1-2.

1.2.2 Pre-Design Groundwater Investigation – 2013

A pre-design investigation (PDI) was completed by Stone Environmental in 2013 to verify the location and dimensions of the TCE plume to better estimate the appropriate location and depth of the PRB. The PDI was completed as a component of the ROD selected remedy to aid in the PRB design. The pre-design investigation included:

- Baseline groundwater sampling of 24 existing onsite monitoring wells
- Synoptic measurement of groundwater elevations in 35 on-site and off-site monitoring wells
- Vertical groundwater profile of VOC plume at 16 locations (WP-01 to WP-16)
- Installation and development of four on-site monitoring wells (MW-24 through MW-27)
- Hydraulic conductivity measurements
- Geotechnical soil sampling (laboratory sieve, bulk density, and effective porosity analyses)
- ZVI treatability study (bench-scale column test) using Site soil and groundwater

The results of the PDI indicated that the plume location had shifted to the south/southeast from the estimated plume delineation shown in the 2010 ROD (see Figure 3 from the ROD and Figures 6 and 10 from Final PDI Report) (Stone, 2013). The PDI also delineated the vertical and horizontal limits of the plume across a transect of groundwater profile locations, which had not been well defined in previous investigations. The results of the ZVI treatability study indicated that ZVI would be effective in remediating the TCE plume at the detected maximum concentrations and Site-specific geochemical conditions. The PDI evaluated a preliminary PRB design approximately 850-feet long centered on the highest concentration axis of the TCE plume and extending to estimated lateral limits of the plume based on the results of the vertical groundwater profile locations. Subsequent evaluation of the data to maximize effectiveness and efficiency of the remedial design suggested a 700-feet long deep section centered on the TCE plume with a shallower 250-feet long section to treat lower TCE concentrations would be effective at mitigating the groundwater contamination.

1.2.3 Baseline Groundwater Investigation

As part of the remedial design investigation work plan (RDIWP) (AECOM, 2015) various field activities were conducted during the fall of 2015 in order to gather data and information needed to complete the final PRB design. The main components of the remedial design investigation (RDI) field activities that related to the PRB design included:

- Installation and development of four compliance well pairs (MW-28 to MW-35) and one additional monitoring well (MW-36) to confirm upgradient edge of groundwater plume

- Collection of 33 baseline groundwater samples
- Performance of a confirmatory ZVI bench scale test
- Performance of aquifer tests including slug testing and hydraulic pulse interference testing (HPIT)

Detailed methods and results of these field activities were presented in the Remedial Action Work Plan (PRB-RAWP) (AECOM, 2016) and the 2015 RDI Work Summary Memo presented in Appendix A of the PRB-RAWP.

1.3 PRB Design Summary

The remedial investigation activities at the Site indicated that variable hydraulic conductivity and hydraulic gradient, and therefore groundwater velocity, conditions may exist at the Site. Therefore, various design cases were analyzed within the range of the measured values to determine the optimum design for the PRB. Three design cases in particular were outlined in the (PRB-RAWP) (AECOM, 2016). These design cases were based on average values from the slug test data and HPIT data from the 2015 RDI activities and historic data from the Stone PDI (Stone, 2013). The three design cases used an average value of 0.004 ft/ft for the hydraulic gradient and varied the hydraulic conductivity from 15.66 ft/day to 193.8 ft/day. This variability of hydraulic conductivity results in a range of groundwater velocity at the Site from 0.128 ft/day to 2.83 ft/day. GeoSierra Environmental, Inc. (GeoSierra), the PRB installation subcontractor, performed a sensitivity analysis based on these design cases and the design of the PRB was chosen based on design scenarios that reflected a conservative approach. A full description of the PRB design including details of each design case is presented in the PRB-RAWP (AECOM, 2016).

1.4 Remedial Action Implementation

In accordance with the ROD for the remedial action at the FSND, a ZVI PRB was installed in order to mitigate the impacted groundwater plume at the Site. AECOM, and its subcontractor GeoSierra, performed the installation of the PRB over the course of 10 months in 2016. The design and installation procedures of the PRB are outlined in the PRB-RAWP (AECOM, 2016). The main components of PRB installation were as follows:

- Installation of 77 injection wells
- Installation of 31 Resistivity strings
- Placement of ZVI into the formation via injection wells
- Post PRB installation HPIT testing

The installation of the ZVI PRB was successfully completed in November of 2016. Details of the PRB construction activities of the PRB are provided in the FER (AECOM, 2017a) for the Site.

2 QUARTERLY GROUNDWATER MONITORING PROGRAM

The eight compliance monitoring wells (MW-28 through MW-35) were installed in pairs so that groundwater quality could be monitored directly upgradient and directly downgradient to of the PRB. The four monitoring wells pairs are installed 20 feet apart on opposite sides of the wall, one being upgradient and one being downgradient, with corresponding screen depths. Figure 2-1 provides a profile of the compliance monitoring wells showing the screened interval in relation to the PRB. Results from the groundwater monitoring program will be used to evaluate the effectiveness of the remedy at decreasing chlorinated VOC concentrations in groundwater and preventing the migration of contaminated groundwater off-site. The compliance well pairs, in addition to MW-24 (downgradient), MW-26 (downgradient), MW-15 (upgradient) and MW-16 (outside of plume), will be sampled quarterly for the first two years (eight quarters) then annually thereafter. The first quarterly sampling event was conducted in December 2016. Monitoring well locations are shown on Figure 1-2 and are described in Table 2-1 below.

Table 2-1: Location of Monitoring Wells

Monitoring Well ID	Location in Relation to PRB
MW-15	Upgradient
MW-16	Outside of Plume
MW-24	Downgradient
MW-26	Downgradient
MW-28	Downgradient
MW-29	Upgradient
MW-30	Downgradient
MW-31	Upgradient
MW-32	Downgradient
MW-33	Upgradient
MW-34	Downgradient
MW-35	Upgradient

Table 2-2 provides the monitoring well sample schedule and analytical information for the groundwater monitoring program. The groundwater monitoring program will be carried out in accordance with the schedule and sampling protocol outlined in the Site Management Plan (SMP) (AECOM, 2017b).

2.1 Sample Collection Methods

Prior to sample collection, depth to water measurements were collected with an electronic water level meter from all accessible wells on Site. Depth to water measurements were taken to the hundredth of a foot from a designated measuring point on the well casing.

The groundwater sampling event was performed in accordance with EPA's low stress, often referred to as low-flow, sampling technique (Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, EPA/540/S-95/504) (EPA, 2010) and is discussed below.

A bladder pump was used to purge the monitoring wells with the pump intake set at the midpoint of the saturated screened interval. During purging, the pump was operated at a flow rate of approximately 100 to 500 milliliters per minute (mL/min) and water levels were monitored to ensure that the pumping rate caused minimal/no drawdown. Dedicated tubing for each monitoring well was used for groundwater sample collection. Field parameters were recorded on the Well Sampling Forms every five minutes during purging, including:

- Purge rate (mL/min)
- Depth to water (0.01 ft)
- Temperature (degrees Celsius)
- pH
- Specific conductance (millisiemens per centimeter [ms/cm])
- Dissolved Oxygen (DO) (milligrams per liter [mg/L])
- Oxidation-Reduction Potential (ORP) (millivolts [mV])
- Turbidity (NTU)

A flow-through cell was used to obtain temperature, pH, specific conductance, DO, and ORP. Turbidity will be measured using a separate instrument. Purging was considered complete when the indicator parameters have stabilized over three consecutive readings. Stabilization parameters include the following:

- Drawdown: less than 0.3 ft drawdown during purging
- pH: ± 0.1 standard unit
- Specific Conductivity: ± 3%
- DO: ± 10 % (mg/L) for values greater than 0.5 mg/L or 3 readings < 0.5 mg/L
- ORP: ±10 mV

- Turbidity: < 5 NTU or ± 10% for readings >5 NTU

Groundwater sample collection field forms with the field parameter readings for each monitoring well are included as Appendix A. Sampling instruments were calibrated daily prior to starting sampling activities, or as needed throughout the day. A log of the field equipment calibration records is provided in Appendix B.

Prior to sample collection, the flow-through cell was disconnected from the dedicated sample tubing and the sample was collected directly from the tubing into the laboratory supplied sample containers. The target flow rate during sample collection was approximately 100 mL/min and sample collection was completed within a single bladder pulse for VOC analysis. Once sampling was complete, the purge water was placed in a 55-gallon drum the conclusion of the sampling event. More detailed procedures for sample collection and handling and waste handling, are included in Appendix H of the SMP (AECOM, 2017b). Appendix G of the SMP includes the analytical QAPP for the site management activities. Appendix I of the SMP includes the HASP for the site management activities.

Groundwater samples were packaged on ice and delivered to ALS Laboratory daily via courier during the sample collection timeframe. Standard chain of custody procedures were used for sample transport. In total, 12 groundwater samples were collected and analyzed for targeted VOCs (EPA method 8260C) and monitored natural attenuation (MNA) parameters including TOC (SM 5310B), alkalinity (SM 2320B), chloride, nitrate, sulfate (EPA Method 300.0), and dissolved gases (methane, ethane, and ethene; Method RSK 175).

3 RESULTS

3.1 Hydrogeologic Results

The groundwater elevations for the Site were determined based on the initial depth to groundwater measurements that were taken prior to sample collection. Table 3-1 shows the groundwater elevation data for the March 2018 sampling event and compares it to the December 2015 baseline sampling event and past sampling event levels. A potentiometric Site map indicating the overburden, groundwater elevation and direction of groundwater flow during the March 2018 sampling event is included as Figure 3-1. Observed general groundwater flow direction in March 2018 was from east to west, which is similar to past sampling events. Between the compliance well pair MW-28 and MW-29 there appears to be a very slight reverse or flat gradient during some sampling events including the March 2018 event.

Based on observed trends during the past sampling events it appears that the groundwater elevation at the Site is subject to seasonal variability. The December 2017 and March 2018 sampling events exhibit lower groundwater elevations than the June and September 2017 sampling event but similar to the December 2016 and March 2017 sampling event, indicating that there is a potential seasonal groundwater level trend at the Site. Groundwater elevation data for the March 2018 event indicate that groundwater levels are currently lower than the top of the PRB wall at the north most monitoring well pairs along the PRB. Meanwhile, the groundwater elevation levels are slightly above the top of the PRB for the south most monitoring well pairs. The current potentiometric surface in relation to the PRB is shown in profile on Figure 2-1A and in relation to along the axis of the estimate plume in Figure 2-1B.

The hydraulic gradient is change in hydraulic head, or water level, per unit distance. The average hydraulic gradient at the Site in the vicinity of the PRB, estimated based on the March 2018 hydrogeologic conditions, was determined to be 0.0031 ft/ft. The March 2018 hydraulic gradient is consistent with the past three quarterly sampling events where the hydraulic gradient was 0.0037ft/ft in June 2017, 0.0028 ft/ft in September 2017, and 0.0039 ft/ft in December 2018. The groundwater seepage velocity is the rate of solute transport through the open pore space in the soil. Based on the March 2018 hydraulic gradient of 0.0031 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day) groundwater seepage velocity at the Site could vary between approximately 0.12 ft/day and 1.50 ft/day. The range of estimated groundwater seepage velocities based on the March 2018 Site conditions (0.12 ft/day-1.50 ft/day) is comparable to the range of estimated groundwater velocities used for the PRB design (0.128 ft/day-2.83 ft/day). Calculations for hydraulic gradient and velocity estimates are included in Appendix C.

The drum of purge water from the March 2018 sampling event was removed from the Site on March 28, 2018 and its contents properly disposed of by the environmental waste services contractor.

3.2 Groundwater MNA Parameter Results

Results of groundwater MNA parameters obtained from the baseline sampling event through the March 2018 quarterly sampling event for the PRB monitoring compliance wells are presented in Table 3-2. MNA parameters were compared between compliance well pairs. In general conductivity values are significantly higher throughout all the compliance well pairs when compared to past sampling events.

During previous quarterly sampling events no significant changes have been observed in DO and ORP concentrations and measurements were variable with some well pairs showing an increase and some pairs showing a decrease. DO measurements during the March 2018 generally had an increase from the previous sampling event, but decreased between each upgradient and downgradient individual monitoring well pair. ORP levels also showed decreases between each upgradient and downgradient pair, with the exception of MW-31 and MW-30. ORP levels decreased significantly from upgradient to downgradient at well pair MW-33/32. These conditions are expected downgradient of the PRB indicating reducing conditions as the groundwater passes through the PRB. Furthermore, low DO and ORP values downgradient indicate that anaerobic conditions exist which promote anaerobic biodegradation. However, it should be noted that there was some increase in DO noted during this sampling event suggesting that anaerobic conditions may not be sustained. The March 2018 groundwater results showed a general increase in methane, ethane, and ethene in most downgradient compliance monitoring wells. For methane, there was a particular increase in downgradient monitoring wells MW-30, MW-32 and MW-34. The largest increase in methane, ethane, and ethene this quarter was again seen in compliance monitoring well pairs in the middle and southern end of the PRB. Initially methane, ethane and ethene concentrations increased from the breakdown of the ZVI carrier fluids (guar). The continued increase in ethane and ethane in downgradient well pairs is indicative of the β-elimination abiotic reaction of CVOCs with the PRB. These compounds, along with acetylene, are final products from the interaction of the ZVI and CVOCs. To date nitrate and sulfate levels have been variable since the 2015 baseline sampling event. In the March 2018 sampling event, nitrate levels were variable in compliance well pairs while all sulfate levels decreased from upgradient to downgradient compliance well pairs. Nitrate and sulfate concentrations are expected to decrease from upgradient to downgradient wells as this would further indicate that bioactivity is occurring.

Overall the MNA data does not show consistency in the well pairs throughout the expanse of the PRB. They will be monitored and expanded as needed to verify the effectiveness of the PRB. The well pair MW-28/MW-29 is screened in the more transmissive upper sand and gravel and does not appear to show the same MNA affects as the other well pairs.

3.3 Groundwater VOC results

The VOC results from the March 2018 quarterly sampling event are presented in Table 3-2. This groundwater sampling included collection of 12 groundwater samples. Figure 3-2 provides a summary of the groundwater VOC results for the monitoring well compliance pairs that exceed the NYSDEC Ambient Water Quality Standards (AWQS) and Guidance Values (GV) found in

the Technical and Operational Guidance Series (TOGS) 1.1.1 (NYSDEC, 1998) and compares the March 2018 sampling event results to the historic sampling event results.

Full analytical reports are included in Appendix D.

The laboratory data was validated by an AECOM chemist and a full data usability summary report (DUSR) was prepared. The DUSR, included in Appendix E, indicated that all data points were usable and no data points were rejected.

A narrative summary of the results is presented below:

- Trichloroethene (TCE), the primary constituent of concern, was detected in 10 of the 12 wells sampled, nine of which were above the AWQS of 5 µg/L. Wells with detectable levels of TCE were MW-15, MW-24, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, and MW-35. The concentration of TCE found in MW-24 was below the AWQS. These results are consistent with past sampling event results.

- No TCE was detected in samples from monitoring wells MW-16 and MW-26. Monitoring Well MW-16 is a plume bounding well located outside of the estimated area of the chlorinated volatile organic compound (CVOC) plume.

- For the March 2018 event all downgradient wells of the compliance well monitoring pairs showed lower levels of TCE concentrations than their upgradient counterparts. The downgradient TCE concentrations ranged from 9.8 µg/L (MW-30) to 153 µg/L (MW-28). These reduced concentrations could be due to either groundwater interaction with the ZVI or enhanced reductive dechlorination (ERD).

- In general detected concentrations of TCE, as well as other CVOCs, for the March 2018 sampling event were consistent with previous groundwater sample results. However, as noted in the preceding bullet there appears to be some reduction in TCE concentrations downgradient of the PRB based on the results of the compliance well pairs.

- 1,1,1-Trichloroethane was detected in three of the 12 wells sampled. The concentration of 1,1,1-Trichloroethane in wells MW-28, MW-29 were above the AWQS of 5 µg/L and the concentration in MW-15 was below the AWQS.

- Wells with detectable levels of tetrachloroethene (PCE) were MW-15, MW-28, and MW-29. The concentration of PCE measured in MW-28 and MW-29 were above the AWGS of 5 µg/L and in MW-15 was below the AWQS.

Graphs showing concentrations of CVOCS were created for the monitoring well compliance pairs to monitor groundwater concentration trends. Data shown includes the baseline sampling

event in December 2015 through the most recent sampling event in March 2018. These trend plots are included in Appendix F as Figures F-1 through F-4. To date no definitive trends have been observed as groundwater concentrations have been generally consistent with the baseline sampling event.

4 SUMMARY AND CONCLUSIONS

The March 2018 groundwater monitoring event was the sixth quarterly groundwater sampling event. Quarterly groundwater sampling will continue on the selected subset of monitoring wells listed in Table 2-1.The next groundwater sampling event will be a Site-wide sampling and is scheduled for June 2018.This event will include groundwater sampling at the 12 designated quarterly sample locations and at the Site-wide annually sampled wells. The next quarterly sampling event will be conducted in the third quarter of 2018. Details regarding the groundwater sampling program for the Site are included in the SMP (AECOM 2017b).

The laboratory results suggest that concentrations of dissolved VOCs in Site groundwater are currently similar to the baseline concentrations before installation of the ZVI PRB and no significant changes has been observed to date. Recent increased methane and ethane concentrations at some downgradient monitoring wells, particularly in the center of the wall, indicate the presence of anaerobic conditions within the subsurface in the vicinity of the PRB. While there had been increased TOC concentrations at the MW compliance pairs noted in the previous sampling events it appears TOC has moved toward baseline conditions. Results from the future sampling rounds will help to verify this trend. Downgradient parameters including the presence of ethane, ethane, and methane suggest that the abiotic degradation of TCE is taking place as impacted groundwater flows through the PRB in most well pairs. The data from the MW-28/MW-29 well pair at the northern end of the wall indicates that the wall may be less effective in the more transmissive sand and gravel or groundwater flow conditions are not optimal in this area of the Site.

Current Site groundwater flow conditions indicate that the on average the hydraulic gradient is consistent with the design. The PRB was designed based on a hydraulic gradient of 0.004 ft/ft which is similar to the estimated hydraulic gradient of 0.0031 ft/ft measured in March 2018. There appears to be a seasonal variability in groundwater elevation and hydraulic gradient which will be better understood as the quarterly monitoring continues. There appears to be a reverse gradient in the MW-28/MW-29 well pair at the northern edge of the wall. In actuality this is likely an area with a flat gradient and the minor vairability in groundwater levels between the well pair is due to margin of error in the survey of the well casing or with the field measurments. Historic data indicates a range of gradients from 0.001 to 0.006 ft/ft measured at the Site (Stone 2013). Based on the current gradient and estimated groundwater seepage velocity groundwater passing through the PRB has reached the downgradient monitoring wells.

5 REFERENCES

AECOM, 2015. Remedial Design Investigation Work Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. November.

AECOM, 2016. Permeable Reactive Barrier Remedial Action Work Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. April.

AECOM, 2017a. Final Engineering Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY.

AECOM, 2017b. Site Management Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY.

AECOM, 2017c. Groundwater Monitoring Program 2016 Fourth Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. April.

AECOM, 2017d. Groundwater Monitoring Program 2017 First Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. May.

AECOM, 2017e. Groundwater Monitoring Program 2016 Second Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. November.

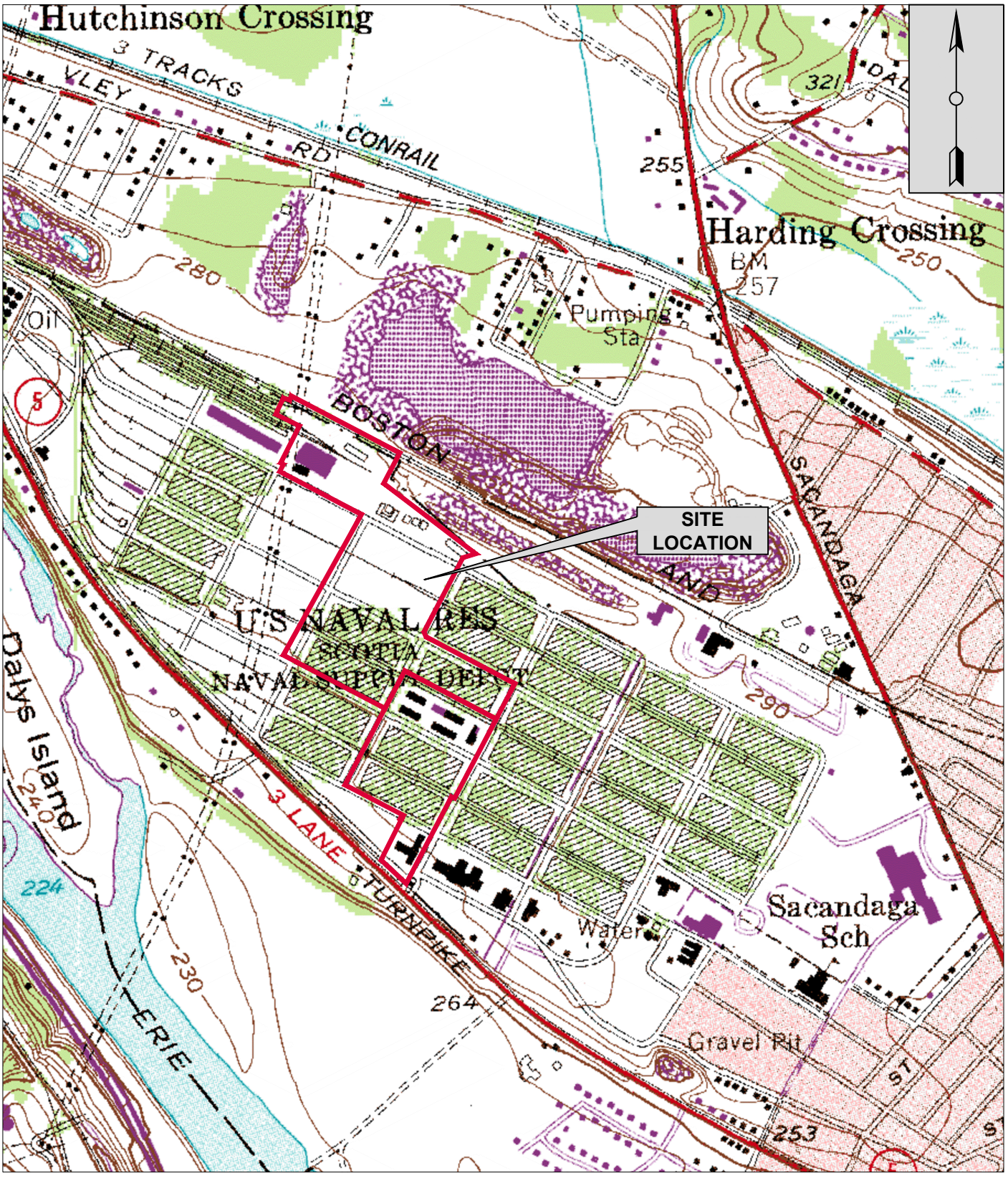
AECOM, 2018. Groundwater Monitoring Program 2017 Third Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. February.

AECOM, 2018a. Groundwater Monitoring Program 2017 Fourth Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. May.

NYSDEC, 2010. Record of Decision for Defense National Stockpile Center Scotia Depot Site State Superfund Project, Site Number 447023, Town of Glenville, NY, March.

Stone Environmental, 2013. Final Pre-Design Investigation Report, Defense Nation Stockpile Center Scotia Depot Site, Town of Glenville, NY, December.

FIGURES



MAP REFERENCE:
IMAGE SHOWN FROM U.S.G.S.7.5 MINUTE
QUADRANGLE, SCHENECTADY SERIES

0 1000' 2000'

2018 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: April 2018

US ARMY Corps
of Engineers

SITE LOCATION MAP

AECOM

Figure: 1-1

AECOM

Figure: 1-2

SITE LAYOUT MAP

250.0 FT. NATIONAL GRID POWER COMPANY EASEMENT

TOWERS

15.0 FT. (TYP.)

250.0 FT. (SHALLOW ZONE)

900.0 FT.

650.0 FT. (DEEP ZONE)

PROPERTY BOUNDARY (TYP.)

CONCRETE REMAINS

80.0'

1st STREET

5th STREET

AVENUE A

AVENUE B

AVENUE C

BUILDING 201

BUILDING 202

BUILDING 203

BUILDING 204

BUILDING 403

BUILDING 404

BUILDING 405

BUILDING 406

MW-5, MW-6, MW-7, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW B-1, PMW-2

GEP-1, GEP-2, GEP-3, GEP-4

LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MW-25 MONITORING WELL
- APPROXIMATE EXTENT OF TCE - TRICHLOROETHENE GROUNDWATER PLUME
- APPROXIMATE EXTENT OF CT - CARBON TETRACHLORIDE GROUNDWATER PLUME

0 200' 400'

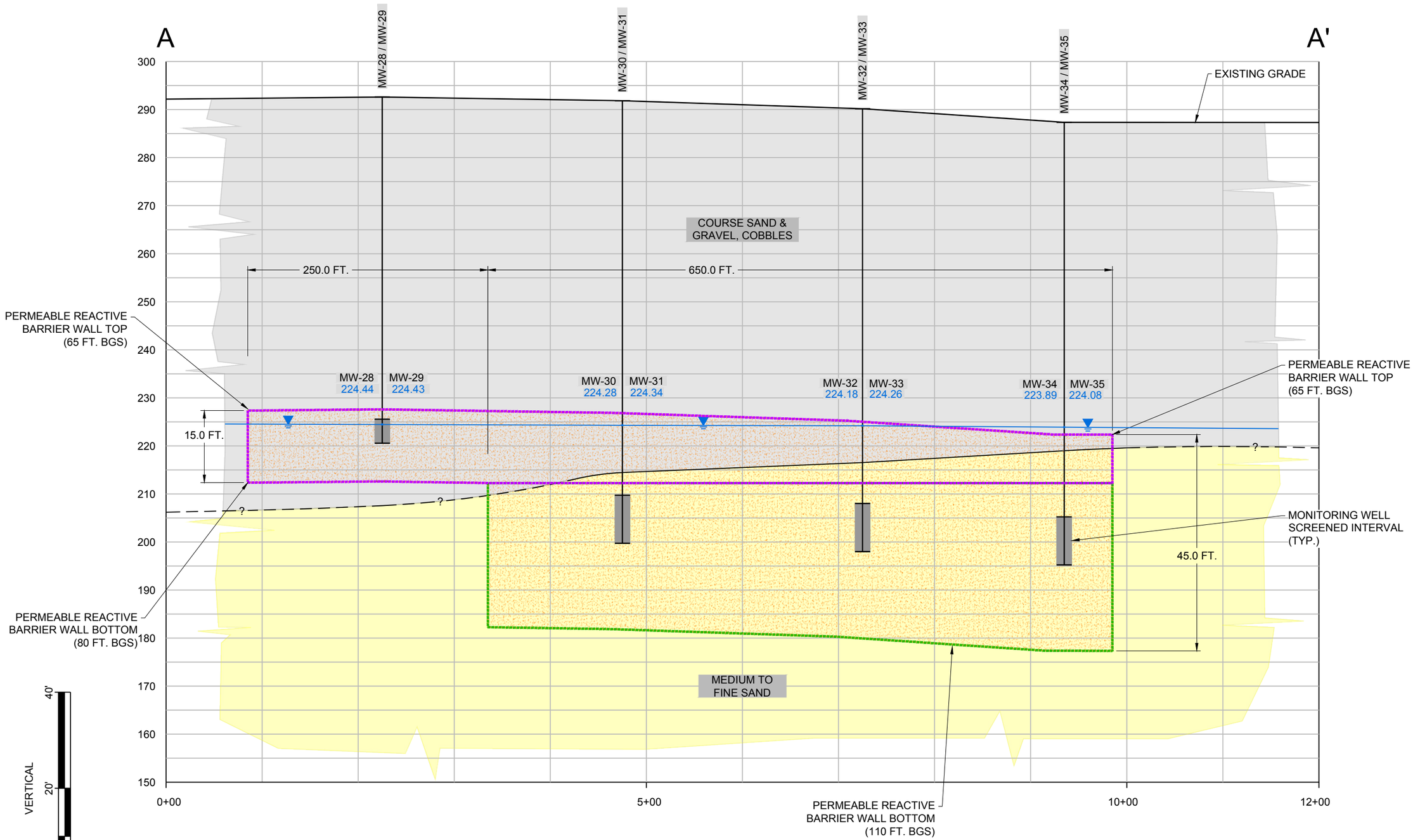
US ARMY Corps of Engineers

2018 1st QUARTER GROUNDWATER REPORT

DEFENSE NATIONAL STOCKPILE CENTER

SCOTIA DEPOT SITE - SCOTIA, NY

Project No.: 60440641 Date: April 2018



SCALE

SECTION A - A'

LEGEND

225.41 GROUNDWATER ELEVATION - MARCH 2018

PERMEABLE REACTIVE BARRIER WALL - 6" THICK

PERMEABLE REACTIVE BARRIER WALL - 3" THICK

AECOM

Figure: 2-1A

COMPLIANCE MONITORING WELLS AND PRB WALL PROFILE GROUNDWATER SECTION A - A' MARCH 2018

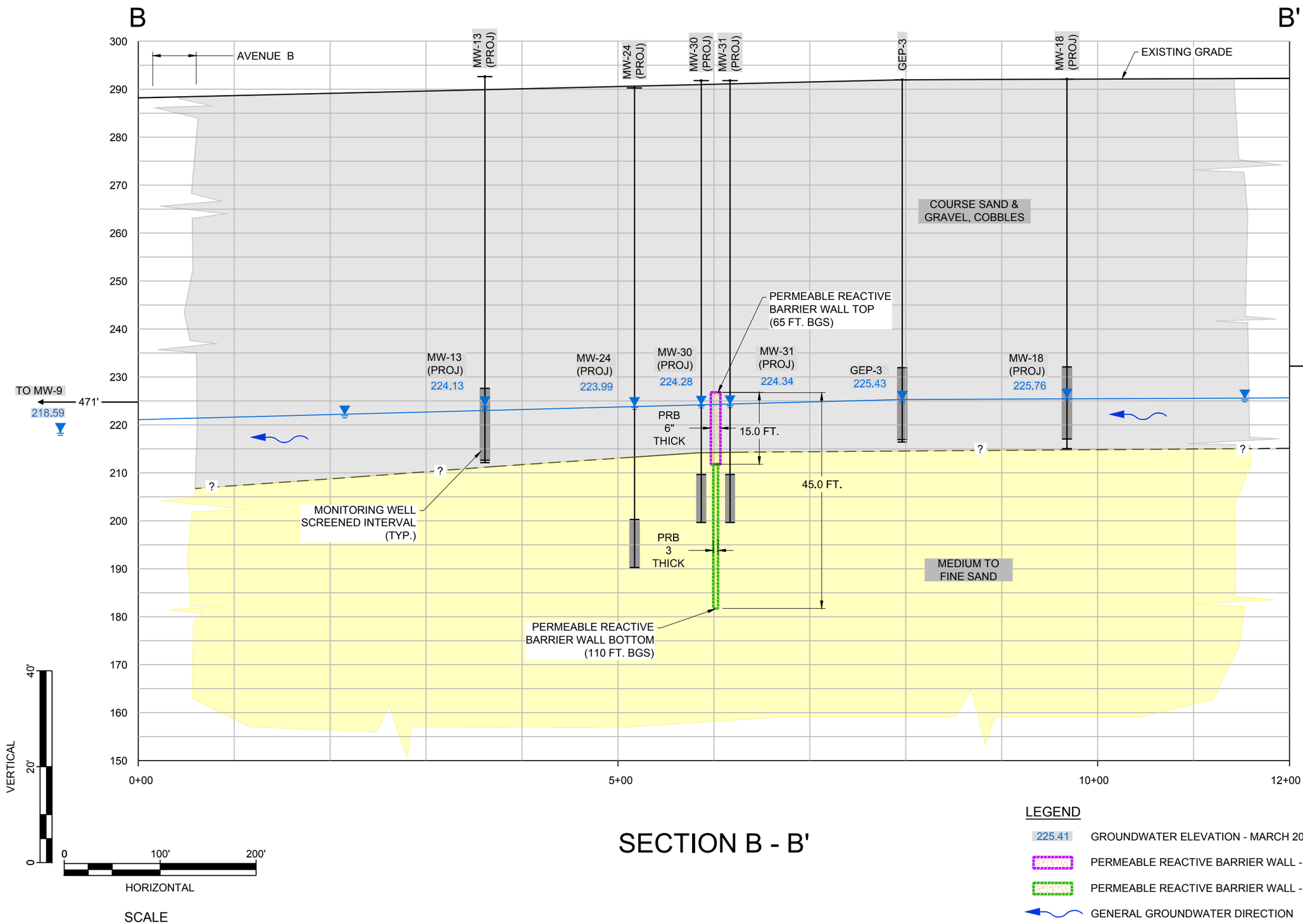
US ARMY Corps of Engineers

2018 1st QUARTER GROUNDWATER REPORT

DEFENSE NATIONAL STOCKPILE CENTER

SCOTIA DEPOT SITE - SCOTIA, NY

Project No.: 60440641 Date: April 2018



AECOM

Figure: 2-1B

GROUNDWATER
SECTION B - B'
MARCH 2018

US ARMY Corps of Engineers

2018 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: April 2018

LEGEND

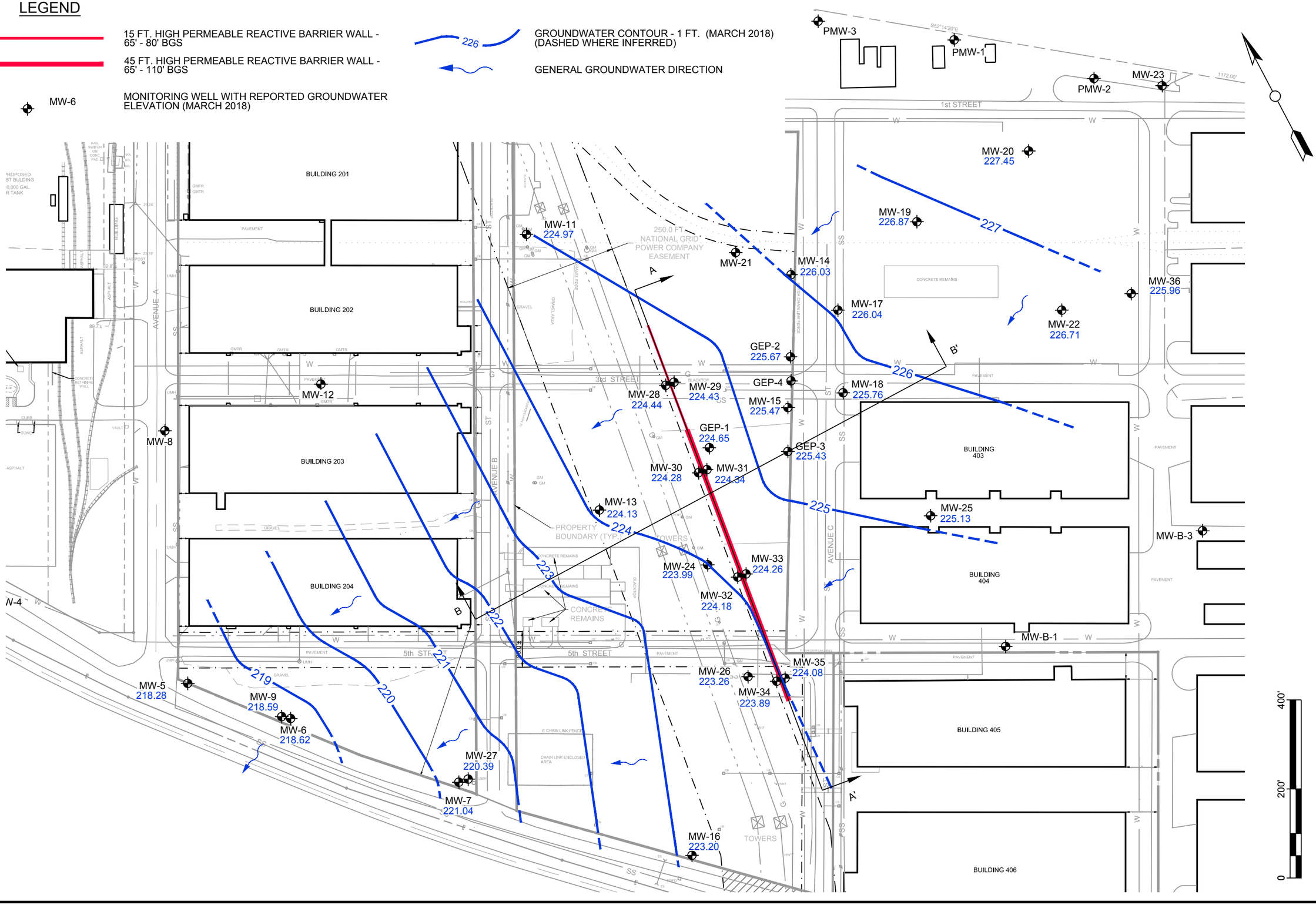
15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS

45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS

MW-6 — MONITORING WELL WITH REPORTED GROUNDWATER ELEVATION (MARCH 2018)

226 — GROUNDWATER CONTOUR - 1 FT. (MARCH 2018) (DASHED WHERE INFERRED)

GENERAL GROUNDWATER DIRECTION



POTENTIOMETRIC SITE MAP
MARCH 2018

AECOM

US ARMY Corps of Engineers

Figure: 3-1

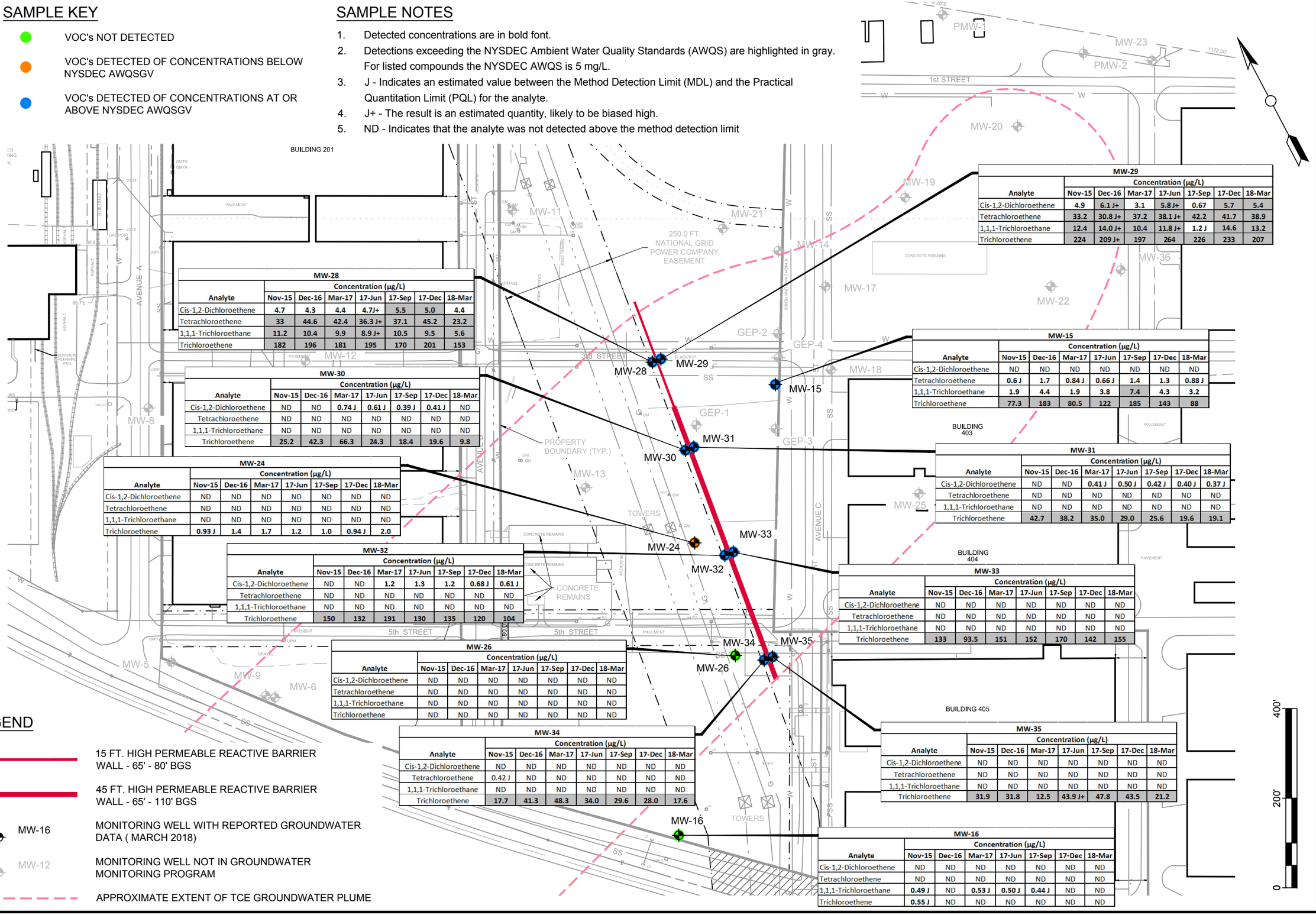
2018 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: April 2018

SAMPLE KEY

- VOC's NOT DETECTED
- VOC's DETECTED OF CONCENTRATIONS BELOW NYSDEC AWQSGV
- VOC's DETECTED OF CONCENTRATIONS AT OR ABOVE NYSDEC AWQSGV

SAMPLE NOTES

1. Detected concentrations are in bold font.
2. Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray. For listed compounds the NYSDEC AWQS is 5 mg/L.
3. J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
4. J+ - The result is an estimated quantity, likely to be biased high.
5. ND - Indicates that the analyte was not detected above the method detection limit



MW-28

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	4.7	4.3	4.4	4.7J+	5.5	5.0	4.4
Tetrachloroethene	33	44.6	42.4	36.3 J+	37.1	45.2	23.2
1,1,1-Trichloroethane	11.2	10.4	9.9	8.9 J+	10.5	9.5	5.6
Trichloroethene	182	196	181	195	170	201	153

MW-30

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	0.74 J	0.61 J	0.39 J	0.41 J	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	25.2	42.3	66.3	24.3	18.4	19.6	9.8

MW-24

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.93 J	1.4	1.7	1.2	1.0	0.94 J	2.0

MW-32

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	1.2	1.3	1.2	0.68 J	0.61 J
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	150	132	191	130	135	120	104

MW-26

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND

MW-34

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.42 J	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	17.7	41.3	48.3	34.0	29.6	28.0	17.6

MW-29

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	4.9	6.1 J+	3.1	5.8 J+	0.67	5.7	5.4
Tetrachloroethene	33.2	30.8 J+	37.2	38.1 J+	42.2	41.7	38.9
1,1,1-Trichloroethane	12.4	14.0 J+	10.4	11.8 J+	1.2 J	14.6	13.2
Trichloroethene	224	209 J+	197	264	226	233	207

MW-15

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.6 J	1.7	0.84 J	0.66 J	1.4	1.3	0.88 J
1,1,1-Trichloroethane	1.9	4.4	1.9	3.8	7.4	4.3	3.2
Trichloroethene	77.3	183	80.5	122	185	143	88

MW-31

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	0.41 J	0.50 J	0.42 J	0.40 J	0.37 J
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	42.7	38.2	35.0	29.0	25.6	19.6	19.1

MW-33

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	133	93.5	151	152	170	142	155

MW-35

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	31.9	31.8	12.5	43.9 J+	47.8	43.5	21.2

MW-16

Analyte	Concentration (µg/L)						
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.49 J	ND	0.53 J	0.50 J	0.44 J	ND	ND
Trichloroethene	0.55 J	ND	ND	ND	ND	ND	ND

LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MW-16 — MONITORING WELL WITH REPORTED GROUNDWATER DATA (MARCH 2018)
- MW-12 — MONITORING WELL NOT IN GROUNDWATER MONITORING PROGRAM
- APPROXIMATE EXTENT OF TCE GROUNDWATER PLUME

0 200' 400'

AECOM

Figure: 3-2

GROUNDWATER RESULTS
QUARTERLY MONITORING LOCATIONS
MARCH 2018

US ARMY Corps of Engineers

2018 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: April 2018

TABLES

Table 2-2
Monitoring Well Sampling Schedule and Guidelines
The Defense National Stockpile Center Scotia Depot

Monitoring Well ID[1]	Rationale[2]	Sampling Frequency	Analytes[3]	Screen Interval (ft bgs)
MW-15	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	65-80
MW-16	Outside Plume	Quarterly for 2 years then anually	VOCs/MNA	55-70
MW-24	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	100-110
MW-26	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	100-110
MW-28	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	67-72
MW-29	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	67-72
MW-30	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-31	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-32	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-33	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-34	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-35	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
GEP-3	Upgradient	Annually	VOCs	59.6-74.6
MW-B-3	Outside Plume	Annually	VOCs	47.5-67.5
MW-5	Downgradient	Annually	VOCs	62.5-72.5
MW-6	Downgradient	Annually	VOCs	58.5-68.5
MW-7	Outside Plume	Annually	VOCs	61-71
MW-8	CT Plume	Annually	VOCs	66-76
MW-9	Downgradient	Annually	VOCs	110-120

Table 2-2
Monitoring Well Sampling Schedule and Guidelines
The Defense National Stockpile Center Scotia Depot

Monitoring Well ID[1]	Rationale[2]	Sampling Frequency	Analytes[3]	Screen Interval (ft bgs)
MW-11	CT Plume	Annually	VOCs	65-80
MW-12	CT Plume	Annually	VOCs	65-80
MW-14	Upgradient	Annually	VOCs	65-80
MW-17	Upgradient	Annually	VOCs	60-75
MW-18	Upgradient	Annually	VOCs	60-75
MW-19	Upgradient	Annually	VOCs	62-77
MW-20	Upgradient	Annually	VOCs	63-78
MW-22	Upgradient	Annually	VOCs	63-78
MW-23	Outside Plume	Annually	VOCs	63-78
MW-24	Downgradient	Annually	VOCs	90-100
MW-25	Upgradient	Annually	VOCs	65-75
MW-26	Downgradient	Annually	VOCs	100-110
MW-27	Downgradient	Annually	VOCs	100-110
MW-36	Upgradient	Annually	VOCs	70-80
GEP-2	Upgradient	Annually	VOCs	60.6-75.6
GEP-1	Upgradient	Annually	VOCs	59.6-74.6
GEP-4	Upgradient	Annually	VOCs	60.15-75.15

Notes:

[1] *2015 Compliance monitoring well

[2] Rationale: Upgradient of PRB wall; Downgradient of PRB wall; Outside of any plume; Within Carbon Tetrachloride (CT) plume

[3] Monitored natural attenuation (MNA) parameters include TOC (EPA SM 5310B), alkalinity (EPA SM 2320B), Chloride, nitrate, sulfate (EPA Method 300.0), and Dissolved Gases (Methane, ethane, and ethene; Method RSK 175).

Table 3-1
Groundwater Elevations Data
The Defense National Stockpile Center Scotia Depot
Fourth Quarter 2017 Status Report
AECOM Project 60440641

Well IDs	Screened Interval (ft bgs)	Ground Surface Elevation (ft)	Reference Point Elevation (ft)	Depth To Water (ft bgs) Q1 2017	Depth to Water (ft bgs) Q2 2017	Depth To Water (ft bgs) Q3 2017	Depth To Water (ft bgs) Q4 2017	Depth To Water (ft bgs) Q1 2018	Groundwater Elevation 2015	Groundwater Elevation 2016	Groundwater Elevation Q1 2017	Groundwater Elevation Q2 2017	Groundwater Elevation Q3 2017	Groundwater Elevation Q4 2017	Groundwater Elevation Q1 2018
B-1	48-68	-	287.14	-	57.34		-	-	227.74	-	-	**229.80**	-	-	-
B-3	47.5-67.5	-	287.05	-	-		-	-	227.95	-	-	-	-	-	-
MW-4	63.8-73.8	289.58	291.74	-	-		-	-	225.74	-	-	-	-	-	-
MW-5	62.5-72.5	287.95	290.11	70.50	63.82	64.00	72.12	71.83	225.75	219.29	219.61	**226.29**	**226.11**	**217.99**	**218.28**
MW-6	58.5-68.5	286.28	288.58	68.78	62.03	62.27	70.19	69.96	225.86	219.80	219.80	**226.55**	**226.31**	**218.39**	**218.62**
MW-7	61-71	286.8	289.26	68.47	61.96	61.95	67.84	68.22	226.28	223.16	220.79	**227.30**	**227.31**	**221.42**	**221.04**
MW-9	110-120	285.98	288.33	68.55	61.85	62.04	69.70	69.74	225.83	219.75	219.78	**226.48**	**226.29**	**218.63**	**218.59**
MW-10	65-80	290.94	293.15	-	-	-	-	-	228.24	-	-	-	-	-	-
MW-11	65-80	295.73	295.12	70.12	64.36	65.36	69.55	70.15	227.7	225.91	225.00	**230.76**	**229.76**	**225.57**	**224.97**
MW-13	65-80	292.62	293.85	69.90	64.25	64.40	68.86	69.72	227.32	225.43	223.95	**229.60**	**229.45**	**224.99**	**224.13**
MW-14	65-80	-	296.2	70.13	64.88	65.60	69.13	70.17	228.08	226.56	226.07	**231.32**	**230.60**	**227.07**	**226.03**
MW-15	65-80	-	293.67	68.35	63.07	63.49	67.00	68.20	227.8	226.27	225.32	**230.60**	**230.18**	**226.67**	**225.47**
MW-16	55-70	-	288.33	66.38	60.7	60.28	63.72	65.13	226.39	225.38	221.95	**227.63**	**228.05**	**224.61**	**223.20**
MW-17	60-75	-	295.24	69.25	64.09	64.66	67.99	69.20	228.08	226.55	225.99	**231.15**	**230.58**	**227.25**	**226.04**
MW-18	60-75	-	295.24	69.56	64.49	64.86	68.15	69.48	227.94	226.46	225.68	**230.75**	**230.38**	**227.09**	**225.76**
MW-19	62-77	-	297.67	70.54	65.74	66.42	69.63	70.80	228.43	226.85	227.13	**231.93**	**231.25**	**228.04**	**226.87**
MW-20	63-78	-	301.55	73.72	69.22	69.90	72.93	74.10	228.71	227.01	227.83	**232.33**	**231.65**	**228.62**	**227.45**
MW-21	57-72	-	296.52	70.55	65.19	65.40	69.70	-	228.06	226.50	225.97	**231.33**	**231.12**	**226.82**	-
MW-22	63-78	-	298.91	72.08	67.64	67.80	70.61	72.20	228.29	226.73	226.83	**231.27**	**231.11**	**228.30**	**226.71**
MW-23	63-78	-	300.54	72.14	67.98	68.55	-	-	228.9	227.06	228.40	**232.56**	**231.99**	-	-
MW-24	90-100	290.24	292.45	68.85	63.4	63.62	67.33	68.46	226.79	225.30	223.60	**229.05**	**228.83**	**225.12**	**223.99**
MW-25	65-75	288.16	290.26	65.44	60.61	60.57	63.56	65.13	227.16	225.82	224.82	**229.65**	**229.69**	**226.70**	**225.13**
MW-26	100-110	287.23	286.45	63.85	58.44	58.35	61.80	63.19	226.06	224.75	222.60	**228.01**	**228.10**	**224.65**	**223.26**
MW-27	100-110	286.08	288.32	68.67	61.89	62.00	67.35	67.93	225.5	223.44	219.65	**226.43**	**226.32**	**220.97**	**220.39**
MW-28	67-72	292.55	292.25	67.94	62.46	63.06	66.72	67.81	227.07	225.41	224.31	**229.79**	**229.19**	**225.53**	**224.44**
MW-29	67-72	292.50	292.13	67.80	62.31	62.94	66.90	67.70	227.05	225.38	224.33	**229.82**	**229.19**	**225.23**	**224.43**
MW-30	82-92	291.76	291.63	67.65	62.19	62.59	66.35	67.35	226.98	225.35	223.98	**229.44**	**229.04**	**225.28**	**224.28**
MW-31	82-92	291.80	291.54	67.42	62.02	62.43	66.14	67.20	226.95	225.40	224.12	**229.52**	**229.11**	**225.40**	**224.34**
MW-32	82-92	290.12	289.75	66.05	60.7	60.82	64.33	65.57	226.86	225.45	223.70	**229.05**	**228.93**	**225.42**	**224.18**
MW-33	82-92	290.27	289.91	66.11	60.8	60.86	64.37	65.65	226.89	225.51	223.80	**229.11**	**229.05**	**225.54**	**224.26**
MW-34	82-92	287.30	287.05	63.70	58.39	58.28	61.54	63.16	226.73	225.48	223.35	**228.66**	**228.77**	**225.51**	**223.89**
MW-35	82-92	287.25	286.96	63.56	58.28	58.15	61.40	62.88	226.69	225.46	223.40	**228.68**	**228.81**	**225.56**	**224.08**
MW-36	70-80	292.61	292.36	66.10	61.87	60.98	64.42	66.40	227.8	226.12	226.26	**230.49**	**231.38**	**227.94**	**225.96**
GEP-1	59.6-74.6	-	294.98	70.55	65.06	-	69.30	70.33	227.36	-	224.43	**229.92**	-	**225.68**	**224.65**
GEP-2	60.6-75.6	-	296.02	70.43	65.18	65.69	69.19	70.35	227.9	226.38	225.59	**230.84**	**230.33**	**226.83**	**225.67**
GEP-3	59.6-74.6	-	292.97	67.71	62.47	62.85	66.30	67.54	227.81	226.31	225.26	**230.50**	**230.12**	**226.67**	**225.43**
GEP-4	60.15-75.15	-	295.62	70.23	65.01	65.50	68.98	-	227.73	226.22	225.39	**230.61**	**230.12**	**226.64**	-

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-15							MW-16						
		11/9/2015	12/14/2016	3/22/2017	6/21/2017	9/28/2017	12/14/2017	3/14/2018	11/11/2015	12/12/2016	3/20/2017	6/20/2017	9/25/2017	12/11/2017	3/13/2018
		Upgradient							Outside Plume						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**1.9**	**4.4**	**1.9**	**3.8**	**7.4**	**4.3**	**3.2**	**0.49 J**	0.75 U	**0.53 J**	**0.50 J**	**0.44 J**	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	**0.44 J**	0.75 U	0.75 U	**0.69 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	**0.45 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	**0.6 J**	**1.7**	**0.84 J**	**0.66 J**	**1.4**	**1.3**	**0.88 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**77.3**	**183**	**80.5**	**122**	**185**	**143**	**88**	**0.55 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**182**	**212**	**201**	**217**	**229**	**216**	**223**	**248**	**312**	**317**	**322**	**480**	NA	**295** 2
Chloride (mg/L)	NS	**28.9**	**14.3**	**28.3**	**40.1**	**30.6**	**39.7**	**24.0**	**13.6**	**9.0**	**5.6**	**20.2**	**4.3**	**4.0**	**2.9**
Nitrate (mg/L)	NS	**0.58**	**0.56**	**0.90**	**0.52**	**0.58**	**0.60**	**0.70**	**1.6**	**1.6**	**2.1**	**3.7**	**1.4**	**1.1**	**1.6**
Sulfate (mg/L)	NS	**12.3**	**12.4**	**21.3**	**20.5**	**14.3**	**20.5**	**12.4**	**35.2**	**44.8**	**65.3**	**75.5**	**64.8**	**119**	**123**
Methane (µg/L)	NS	**0.19 J**	**0.21 J**	**0.21 J**	**0.25 J**	**0.21 J**	0.50 U	**0.18 J**	0.25 U	**0.14 J**	0.50 U	0.19 J	**0.23 J**	0.50 U	0.25 U
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**0.55 J**	**0.57 J**	**0.47 J**	**0.21 J**	**0.59 J**	**0.33 J**	**0.26 J**	**3.6**	**0.96 J**	**1.1**	**0.67 J**	**0.64 J**	**0.9 J**	**0.86 J**
Field Parameters															
Turbidity (NTU)	NS	11.1	7.00	15.7	2.10	52.1	6.30	9.22	8.01	14.8	7.71	4.40	199	30.9	8.14
ORP (MeV)	NS	91.4	54.6	-0.6	114.6	92.8	16.6	-1.1	137.6	139.9	115.9	298.7	82.2	94.5	118.7
Conductivity (mS/cm)	NS	0.358	0.250	0.387	0.487	0.709	0.416	0.295	0.361	0.388	0.436	0.486	0.928	0.596	0.462
Dissolved Oxygen (mg/L)	NS	31.45	8.04	6.37	4.90	9.22	8.38	7.64	22.27	9.50	10.40	10.82	9.81	10.30	10.09
Groundwater Elevation (ft)	NS	227.80	226.27	225.32	230.60	230.18	226.67	225.47	226.39	225.38	221.95	227.63	228.05	224.61	223.20

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-24							MW-26						
		11/10/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/14/2018	11/17/2015	12/13/2016	3/21/2017	6/26/2017	9/25/2017	12/12/2017	3/14/2018
		Downgradient							Downgradient						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.37 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.57 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**0.93 J**	**1.4**	**1.7**	**1.2**	**1.0**	**0.94 J**	**2.00**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**168**	**198**	**205**	**195**	**282**	**352**	**313**	**204**	**197**	**196**	**223**	**317**	**204**	**196**
Chloride (mg/L)	NS	**36.3**	**38.5**	**59.0**	**41.0**	**110**	**155**	**60.8**	**45.2**	**44.9**	**53.4**	**133**	**86.2**	**56.7**	**32.3**
Nitrate (mg/L)	NS	**0.9**	0.06 U	0.06 U	**0.04 J**	0.06 U	0.06 U	0.06 U	0.06 U	**0.04 J**	0.06 U	**0.02 J**	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**15.5**	**21.4**	**24.1**	**22.1**	0.5 U	**0.48 J**	**0.22 J**	**25.1**	**24.6**	**29.4**	**20.9**	**5.9**	**25.7**	**10.6**
Methane (µg/L)	NS	**0.82**	**1.6**	**1.7**	**2.2**	**7.8**	**431**	**927**	**34.8**	**2.7**	**1.4 J**	**2.1**	**444**	**20.7**	**26.6**
Ethane (µg/L)	NS	**0.34 J**	0.50 U	0.50 U	0.50 U	**0.29 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**1.0 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**3.5**	**1.9**	**1.0 J**	**0.79 J**	**94.6**	**96.2**	**44.1**	**9.3**	**2.6**	**1.3 J**	**30.7**	**52.1**	**1.1**	**5.8 J**
Field Parameters															
Turbidity (NTU)	NS	9.33	13.9	16.3	35.2	88.37	2.8	16.0	68.3	21.8	31.9	0.4	60.96	57.38	18.6
ORP (MeV)	NS	-80.2	-93.2	-111.3	-108.6	-169.9	-83.1	-127.6	-103.6	-28.9	-46.4	-26.9	-138.7	-173.0	-89.4
Conductivity (mS/cm)	NS	0.327	0.570	0.438	0.365	1.396	8.411	0.409	0.324	0.590	0.469	0.630	1.347	0.426	0.260
Dissolved Oxygen (mg/L)	NS	0.94	0.44	0.55	1.20	0.30	0.15	0.55	0.00	0.33	0.27	0.62	0.33	0.66	0.27
Groundwater Elevation (ft)	NS	226.79	225.30	223.60	229.05	228.83	225.12	223.99	226.06	224.75	222.60	228.01	228.10	224.65	223.26

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair													
		MW-28							MW-29						
		12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018	12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018
		Downgradient							Upgradient						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**11.2**	**10.4**	**9.9**	**8.9 J**	**10.5**	**9.5**	**5.6**	**12.4**	**14.0 J**	**10.4**	**11.8 J**	**13.6**	**14.6**	**13.2**
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	**0.46 J**	0.75 U	0.75 U	0.75 U	0.75 U	**0.33 J**	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	**1.0**	**0.77 J**	**0.88 J**	**1.0 J**	**1.3**	**0.84 J**	**0.69 J**	**0.97 J**	3.8 U	**0.45 J**	**1.0 J**	**1.2**	**0.88 J**	**0.91 J**
1,1-Dichloroethene (1,1-DCE)	5	**0.53 J**	**0.43 J**	**0.53 J**	**0.38 J**	**0.76 J**	**0.45 J**	0.75 U	**0.68 J**	3.8 U	**0.55 J**	**0.63 J**	**0.99 J**	**0.96 J**	**0.77 J**
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	**0.61 J**	0.75 U	**0.62 J**	0.75 U	**0.53 J**	**0.57 J**	0.75 U	0.75 U	3.8 U	**0.63 J**	0.75 U	**0.85 J**	**0.71 J**	**0.72 J**
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	**4.7**	**4.3**	**4.4**	**4.7 J**	**5.5**	**5.0**	**4.4**	**4.9**	**6.1 J**	**3.1**	**5.8 J**	**5.6**	**5.7**	**5.4**
Tetrachloroethene (PCE; PERC)	5	**33**	**44.6**	**42.4**	**36.3 J**	**37.1**	**45.2**	**23.2**	**33.2**	**30.8 J**	**37.2**	**38.1 J**	**42.2**	**41.7**	**38.9**
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	**0.47 J**	**0.42 J**	**0.37 J**	**0.35 J**	**0.49 J**	0.75 U	0.75 U	3.8 U	**0.61 J**	**0.70 J**	**0.67 J**	**0.62 J**	**0.44 J**
Trichloroethene (TCE)	5	**182**	**196**	**181**	**195**	**170**	**201**	**153**	**224**	**209 J**	**197**	**264**	**226**	**233**	**207**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**352**	**316**	**295**	**352**	**380**	**383**	**360**	**327**	**301**	**258**	**361**	**374**	**348**	**360**
Chloride (mg/L)	NS	**22.1**	**32.4**	**25.7**	**29.0**	**25.7**	**20.4**	**20.9**	**28.2**	**28.4**	**21.3**	**49.4**	**24.2**	**21.3**	**23.4**
Nitrate (mg/L)	NS	0.06 U	**0.06 J**	**0.44**	**1.5**	**0.18 J**	**1.2**	**1.5**	**0.1 J**	**0.26**	**0.52**	**1.3**	**0.12 J**	**0.86**	**1.3**
Sulfate (mg/L)	NS	**22.4**	**20.9**	**21.6**	**13.0**	**10.3**	**22.4**	**20.2**	**29.2**	**24.9**	**20.1**	**13.8**	**16.1**	**22.7**	**15**
Methane (µg/L)	NS	**3.4**	**3.0**	**0.94**	**1.0**	**0.37 J**	0.50 U	0.25 U	**13.9**	**0.62**	**1.1**	**0.20 J**	**0.21 J**	0.50 U	0.25 U
Ethane (µg/L)	NS	0.50 U	**3.6**	**1.0**	0.50 U	**0.45 J**	0.50 U	0.50 U	**0.81 J**	0.50 U	0.5 U	0.50	0.50 U	0.50 U	0.50 U
Ethene (µg/L)	NS	0.75 U	**1.3 J**	**1.9**	0.75 U	**0.72 J**	0.75 U	0.75 U	**0.59 J**	0.75 U	0.75 U	0.75	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**1.9**	**2.3**	**0.81 J**	**0.76 J**	**1.9**	**0.94 J**	**0.36 J**	**2.3**	**1.4**	**0.91 J**	**0.92 J**	**2.1**	**1.2**	**0.38 J**
Field Parameters															
Turbidity (NTU)	NS	209	1.5	2.07	-3	61.1	229.80	8.52	82.4	0.62	2.73	2.80	65.1	1.50	8.11
ORP (MeV)	NS	273	71.2	77.1	97.4	32.1	19.0	-16.3	-25.1	60.9	46.1	120	41.7	33.7	2.8
Conductivity (mS/cm)	NS	0.324	0.366	0.520	0.554	1.045	0.564	0.406	0.325	0.354	0.424	0.619	1.058	0.559	0.420
Dissolved Oxygen (mg/L)	NS	6.75	3.94	5.2	7.59	4.3	8.45	11.96	4.29	6.17	9.26	7.12	6.46	8.65	7.42
Groundwater Elevation (ft)	NS	227.07	225.41	224.31	229.79	229.19	225.53	224.44	227.05	225.38	224.33	229.79	229.19	225.23	224.43

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair													
		MW-30							MW-31						
		12/1/2015	12/13/2016	3/21/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018	12/1/2015	12/14/2016	3/22/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018
		Downgradient							Upgradient						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**0.74 J**	**0.61 J**	**0.39 J**	**0.41 J**	0.75 U	0.75 U	0.75 U	**0.41 J**	**0.50 J**	**0.42 J**	**0.40 J**	**0.37 J**
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**25.2**	**42.3**	**66.3**	**24.3**	**18.4**	**19.6**	**9.8**	**42.7**	**38.2**	**35.0**	**29.0**	**25.6**	**19.6**	**19.1**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**143**	**319**	**210**	**154**	**104**	**347**	**141**	**178**	**222**	**381**	**150**	**132**	**119**	**143**
Chloride (mg/L)	NS	**38.4**	**182**	**136**	**49.6**	**35.3**	**87.3**	**43.6**	**41.9**	**56.6**	**98.5**	**31.0**	**31.7**	**36.3**	**50.6**
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	**0.04 J**	**0.02 J**	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**35.9**	**2.9**	0.5 U	**0.32 J**	0.5 U	**0.22 J**	0.50 U	**26.3**	**10.9**	**2.6**	**5.6**	**5.6**	**7.8**	**6.7**
Methane (µg/L)	NS	**47.4**	**146**	**870**	**3210**	**3560**	**12900**	**5860**	**20.7**	**3.5**	**106**	**56.5**	**29.1**	**59.4**	**34.4**
Ethane (µg/L)	NS	**4.7**	**5.4**	**23.5**	**36.7**	**39.7**	**40.5**	**31.1**	**2.2**	**1.5**	**10.1**	**2.7**	**2.6**	**3.3**	**2.6**
Ethene (µg/L)	NS	**2.2**	**3.3**	**9.1**	**12.7**	**8.5**	**4.2**	**2.2**	**0.91 J**	**0.84 J**	**4.7**	**3.2**	**2.3**	**1.9**	**1.6**
Total Organic Carbon (mg/L)	NS	**2.2**	**225**	**139**	**75.2**	**27.0**	**366**	**50.9**	**2.1**	**43.9**	**257**	**2.8**	**1.5**	**1.3**	**1.1**
Field Parameters															
Turbidity (NTU)	NS	58.2	3.55	3.82	3	69.1	16.1	3.12	51.7	8.03	11.4	4.60	8.60	8.62	2.95
ORP (MeV)	NS	-278.4	-166.3	-166.9	-173.3	-212.2	-170.1	-122.8	-319.7	-163.1	-201.5	-283.2	-174.4	-208.0	-161.7
Conductivity (mS/cm)	NS	0.210	1.410	0.740	0.320	0.412	0.758	0.212	0.243	0.348	0.850	0.280	0.526	0.294	0.261
Dissolved Oxygen (mg/L)	NS	3.70	0.29	0.17	0.48	0.06	0.80	0.19	1.29	0.28	0.22	0.70	0.13	0.19	0.17
Groundwater Elevation (ft)	NS	226.98	225.35	223.98	229.44	229.04	225.28	224.28	226.95	225.40	224.12	229.52	229.11	225.40	224.34

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair													
		MW-32							MW-33						
		11/30/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018	11/24/2015	12/14/2016	3/22/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018
		Downgradient							Upgradient						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	**0.40 J**	**0.48 J**	**0.60 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**1.2**	**1.3**	**1.2**	**0.68 J**	**0.61 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**150**	**132**	**191**	**130**	**135**	**120**	**104**	**133**	**93.5**	**151**	**152**	**170**	**142**	**155**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**196**	**277**	**214**	**129**	**129**	**141**	**162**	**172**	**218**	**194**	**205**	**202**	**212**	**215**
Chloride (mg/L)	NS	**35.6**	**138**	**84.6**	**38.0**	**30.7**	**28.2**	**25.4**	**41.8**	**43.2**	**29.2**	**22.8**	**24.6**	**28.1**	**23.0**
Nitrate (mg/L)	NS	0.06 U	0.06 U	**0.02 J**	**0.02 J**	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	**0.32**	**0.32**	**0.30**	**0.32**	**0.34**
Sulfate (mg/L)	NS	**21.1**	**2.8**	**0.68 J**	**0.50 J**	**0.4 J**	**6.0**	**7.1**	**25.1**	**8.2**	**15.0**	**11.8**	**12.6**	**14.8**	**11.6**
Methane (µg/L)	NS	**6.8**	**16.5**	**309**	**817**	**835**	**233 J**	**583**	**64**	**3.4**	**9.2**	**16.0**	**17.8**	**7.2**	**6.1**
Ethane (µg/L)	NS	**0.5 J**	**1.5**	**19.3**	**35.9**	**29.4**	**5.6 J**	**10.7**	**7**	**0.25 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethene (µg/L)	NS	0.75 U	**1.8**	**10.3**	**15.6**	**5.4**	**2.3 J**	**3.3**	**3.6**	**0.48 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**2.6**	**133**	**98.0**	**22.0**	**5.0**	**5.4 J**	**2.7**	**8.1**	**30.9**	**2.1**	**0.54 J**	**0.44 J**	**0.44 J**	**0.83 J**
Field Parameters															
Turbidity (NTU)	NS	180	5.92	4.01	5.10	3.91	5.11	1.36	23.1	9.31	11.7	3.40	51.2	6.38	9.18
ORP (MeV)	NS	-234.2	-107.7	-140.7	-238.7	-149.4	-181.9	-106.4	-471.2	-126.8	-64.3	44.9	-3.2	-20.4	-49.9
Conductivity (mS/cm)	NS	0.239	1.180	0.640	0.261	0.478	0.257	0.239	0.247	0.303	0.386	0.350	0.648	0.370	0.285
Dissolved Oxygen (mg/L)	NS	0.64	1.81	1.77	2.50	1.80	1.50	0.25	0.92	0.41	2.50	2.99	2.87	6.80	1.89
Groundwater Elevation (ft)	NS	226.86	225.45	223.70	229.05	228.93	225.42	224.18	226.89	225.51	223.80	229.11	229.05	225.54	224.26

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair													
		MW-34							MW-35						
		11/24/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018	11/24/2015	12/15/2016	3/22/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018
		Downgradient							Upgradient						
VOCs (µg/L)															
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	**0.42 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**17.7**	**41.3**	**48.3**	**34.0**	**29.6**	**28.0**	**17.6**	**31.9**	**31.8**	**12.5**	**43.8 J**	**47.8**	**43.5**	**21.2**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters															
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**99**	**191**	**597**	**201**	**197**	**203**	**174**	**181**	**223**	**51**	**202**	**192**	**210**	**171**
Chloride (mg/L)	NS	**48.5**	**62.3**	**461**	**15.7**	**11.7**	**12.9**	**15.4**	**42.2**	**53.9**	**2.0**	**17.1**	**14.4**	**22.2 J+**	**14.5**
Nitrate (mg/L)	NS	**0.56**	**0.06 J**	0.06 U	**0.04 J**	0.06 U	**0.02 J**	**0.02 J**	0.06 U	**0.04 J**	**0.14 J**	**0.66**	**0.6**	**0.44**	**0.44**
Sulfate (mg/L)	NS	**64.3**	**23.8**	**0.56 J**	**13.4**	**9.0**	**7.3**	**8.5**	**48.1**	**7.2**	**3.5**	**13.6**	**10.8**	**10.2**	**8.5**
Methane (µg/L)	NS	**14.5**	**1.2**	**1780**	**12.4**	**88.1**	**531**	**1260**	**13.8**	**0.90**	**5.8**	**7.2**	**7.5**	**7.9**	**32.7**
Ethane (µg/L)	NS	**2.2**	0.50 U	**17.3**	0.50 U	**0.45 J**	**1.1**	**1.3**	**2.9**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethene (µg/L)	NS	**1.8**	0.75 U	**4.4**	0.75 U	**0.58 J**	0.75 U	0.75 U	**1.6**	0.75 U	**0.32 J**	0.75 U	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**5.9**	**12.0**	**631**	**3.3**	**3.8**	**4.1**	**3.4**	**7.7**	**18.3**	**1.4**	**0.75 J**	**0.68 J**	**0.56 J**	**1.2**
Field Parameters															
Turbidity (NTU)	NS	44.7	3.23	4.59	-4	4.40	4.20	5.63	381	5.99	16.3	38.2	31.91	13.81	11.00
ORP (MeV)	NS	-185.4	-8.4	-144.0	-139.4	-63.1	-133.4	25.0	-404	-167.9	-68.4	-10.6	30	0.40	57.10
Conductivity (mS/cm)	NS	0.361	0.630	2.280	0.332	0.578	0.310	0.234	0.287	0.329	0.078	0.324	0.600	0.338	0.218
Dissolved Oxygen (mg/L)	NS	6.9	1.12	0.12	0.46	0.62	2.70	0.34	0.79	0.41	6.63	3.67	4.58	4.84	1.32
Groundwater Elevation (ft)	NS	226.73	225.48	223.35	228.66	228.77	225.51	223.89	226.69	225.46	223.40	228.68	228.81	225.56	224.08

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

APPENDICES

APPENDIX A: Groundwater Sample Collection Field Forms

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-15 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-15 031418 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	81.74	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	68.20	feet
4. C = Column of Water in Well:	13.54	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	2.21	gal
6. 3(V) = Target Purge Volume	6.62	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

65-80

Pump set @ ~73'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1300	1305	1310	1315	1320	1325	1330
Water Level (0.33)	feet	68.20	68.20	68.20	68.20	68.20	68.20	68.19
Volume Purged	gal	0	0.20	0.40	0.60	0.80	1.00	1.20
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	87.2	213	143	112	58.3	21.4	11.0
Dissolved Oxygen (+/- 10%)	%	97.6	71.8	67.8	68.0	66.4	66.7	67.8
Dissolved Oxygen (+/- 10%)	mg/L	11.41	8.18	7.66	7.75	7.54	7.47	7.59
Eh / ORP (+/- 10)	MeV	-5.1	-6.4	-3.7	-4.3	-3.8	-3.9	-3.7
Specific Conductivity (+/- 3%)	mS/cm[c]	0.399	0.396	0.396	0.405	0.408	0.412	0.413
Conductivity (+/- 3%)	mS/cm	0.274	0.280	0.286	0.286	0.288	0.295	0.297
pH (+/- 0.1)	pH unit	8.07	8.02	7.99	8.00	7.96	7.97	7.97
Temp (+/- 0.5)	C°	9.04	9.60	9.77	9.59	9.67	10.17	10.30
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: Sampled @ 1345

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-15 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-15 031418 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	(see prev)	feet
2. D = Riser Diameter (I.D.):	-	feet
3. W = Depth to Water:	-	feet
4. C = Column of Water in Well:	-	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	-	gal
6. 3(V) = Target Purge Volume	-	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	1335	1340	1345				
Water Level (0.33)	feet	68.20	68.20	68.20				
Volume Purged	gal	1.40	1.60	1.80				
Flow Rate	mL/min	200	200	200				
Turbidity (+/- 10%)	NTU	9.62	9.31	9.22				
Dissolved Oxygen (+/- 10%)	%	67.4	68.3	68.0				
Dissolved Oxygen (+/- 10%)	mg/L	7.55	7.69	7.64				
Eh / ORP (+/- 10)	MeV	-2.9	-1.7	-1.1				
Specific Conductivity (+/- 3%)	mS/cm[c]	0.412	0.411	0.411				
Conductivity (+/- 3%)	mS/cm	0.296	0.295	0.295				
pH (+/- 0.1)	pH unit	7.96	7.95	7.94				
Temp (+/- 0.5)	C°	10.27	10.22	10.15				
Color	Visual	clear	clear	clear				
Odor	Olfactory	No	No	No				

Comments: Sampled @ 1345

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-16 Date: 3/13/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-16 031318 QA/QC Collected? —

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	69.51	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	65.13	feet
4. C = Column of Water in Well:	4.38	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	0.71	gal
6. 3(V) = Target Purge Volume	2.14	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Set pump @ ~67'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100 Q

Parameter	Units	Readings							
Time	24 hr	1047	1052	1057	1102	1107	1112	1117	1122
Water Level (0.33)	feet	65.20	65.20	65.20	65.20	65.20	65.20	65.20	65.20
Volume Purged	gal	0	0.2	0.4	0.8	1.10	1.60	2.00	2.40
Flow Rate	mL/min	250	250	250	250	250	250	250	250
Turbidity (+/- 10%)	NTU	189	122	70.7	32.7	17.9	8.56	8.28	8.14
Dissolved Oxygen (+/- 10%)	%	93.9	91.5	89.1	88.6	91.3	88.2	88.9	88.6
Dissolved Oxygen (+/- 10%)	mg/L	10.74	10.46	10.18	10.12	10.41	10.12	10.15	10.09
Eh / ORP (+/- 10)	MeV	131.3	130.1	119.9	119.7	120.1	119.3	118.3	118.7
Specific Conductivity (+/- 3%)	mS/cm[c]	0.715	0.701	0.682	0.674	0.668	0.663	0.661	0.656
Conductivity (+/- 3%)	mS/cm	0.494	0.491	0.479	0.474	0.469	0.465	0.464	0.462
pH (+/- 0.1)	pH unit	5.89	6.04	6.41	6.52	6.61	6.69	6.72	6.76
Temp (+/- 0.5)	C°	8.81	9.31	9.46	9.47	9.37	9.36	9.38	9.42
Color	Visual	cloudy	cloudy	cloudy	cloudy	cloudy	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No	No

Comments:

Sampled @ 1122

* Noted Sulfur odor during Sampling

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-24 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-24 031418 QA/QC Collected? [redacted] None

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	103.42	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	68.46	feet
4. C = Column of Water in Well:	34.96	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	5.76	gal
6. 3(V) = Target Purge Volume	17.10	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Pump set @ 101'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100Q

Parameter	Units	Readings							
Time	24 hr	940	945	950	955	1000	1005	1010	1015
Water Level (0.33)	feet	68.50	68.50	68.50	68.51	68.51	68.51	68.51	68.51
Volume Purged	gal	0	0.2	0.40	0.60	0.80	1.00	1.25	1.50
Flow Rate	mL/min	230	230	230	230	230	230	230	230
Turbidity (+/- 10%)	NTU	14.7	12.3	19.3	19.5	19.0	16.7	16.4	16.0
Dissolved Oxygen (+/- 10%)	%	77.4	70.2	34.7	12.6	7.1	5.7	5.4	5.1
Dissolved Oxygen (+/- 10%)	mg/L	9.56	8.61	4.17	1.49	0.84	0.68	0.60	0.55
Eh / ORP (+/- 10)	MeV	-50.0	-56.5	-77.5	-105.0	-114.6	-118.4	-122.1	-124.6
Specific Conductivity (+/- 3%)	mS/cm^c	0.496	0.512	0.543	0.564	0.580	0.589	0.600	0.611
Conductivity (+/- 3%)	mS/cm	0.319	0.332	0.360	0.382	0.392	0.400	0.407	0.409
pH (+/- 0.1)	pH unit	7.85	7.89	7.93	8.00	7.96	8.08	7.97	7.97
Temp (+/- 0.5)	C°	6.28	6.73	7.41	8.08	7.96	7.97	8.40	8.50
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No	No

Comments: Sampled @ 1015

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-26 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-26031418 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	108.90	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	63.19	feet
4. C = Column of Water in Well:	45.71	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	7.50	gal
6. 3(V) = Target Purge Volume	22.35	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Pump set @ 104'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556/ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	810	815	820	825	830	835	840
Water Level (0.33)	feet	63.20	63.20	63.20	63.20	63.20	63.20	63.20
Volume Purged	gal	0	0.25	0.50	0.75	1.10	1.30	1.50
Flow Rate	mL/min	200	200	200	200	220	220	220
Turbidity (+/- 10%)	NTU	24.1	79.2	65.0	36.1	33.1	24.0	20.0
Dissolved Oxygen (+/- 10%)	%	55.2	29.3	6.1	5.8	5.3	3.5	3.1
Dissolved Oxygen (+/- 10%)	mg/L	7.12	3.57	0.72	0.68	0.62	0.40	0.37
Eh / ORP (+/- 10)	MeV	228.2	52.4	-41.4	-45.5	-49.4	-64.8	-71.7
Specific Conductivity (+/- 3%)	mS/cm^c	0.343	0.319	0.334	0.337	0.337	0.346	0.353
Conductivity (+/- 3%)	mS/cm	0.209	0.207	0.226	0.227	0.228	0.236	0.241
pH (+/- 0.1)	pH unit	6.91	7.21	7.39	7.41	7.41	7.44	7.47
Temp (+/- 0.5)	C°	4.61	6.78	8.14	8.01	8.16	8.31	8.39
Color	Visual	clear	clear	clear	clear	Clear	Clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: Sampled @ 0955

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-26 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-26 031418 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	See prev	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:		feet
4. C = Column of Water in Well:		feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$		gal
6. 3(V) = Target Purge Volume		gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	845	850	855				
Water Level (0.33)	feet	63.22	63.22	63.22				
Volume Purged	gal	1.70	2.00	2.25				
Flow Rate	mL/min	220	220	220				
Turbidity (+/- 10%)	NTU	19.8	18.8	18.6				
Dissolved Oxygen (+/- 10%)	%	2.7	2.5	2.3				
Dissolved Oxygen (+/- 10%)	mg/L	0.31	0.29	0.27				
Eh / ORP (+/- 10)	MeV	-78.9	-82.0	-89.4				
Specific Conductivity (+/- 3%)	mS/cm^c	0.365	0.376	0.380				
Conductivity (+/- 3%)	mS/cm	0.249	0.258	0.260				
pH (+/- 0.1)	pH unit	7.49	7.54	7.56				
Temp (+/- 0.5)	C°	8.45	8.62	8.57				
Color	Visual	clear	clear	clear				
Odor	Olfactory	NO	NO	NO				

Comments: Sampled @ 855

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-28 Date: 3/15/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-28 031518 QA/QC Collected? N1

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	71.86	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	67.81	feet
4. C = Column of Water in Well:	4.05	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.66	gal
6. 3(V) = Target Purge Volume	1.98	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

67-72 Pump set ~ 69'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 21002

Parameter	Units	Readings						
Time	24 hr	950	955	1000	1005	1010	1015	1020
Water Level (0.33)	feet	67.86	67.86	67.86	67.86	67.86	67.86	67.86
Volume Purged	gal	0	0.25	0.60	0.80	1.20	1.40	1.60
Flow Rate	mL/min	200	200	200	200	250	250	250
Turbidity (+/- 10%)	NTU	62.4	32.5	22.1	20.5	9.01	8.63	8.52
Dissolved Oxygen (+/- 10%)	%	101.5	102.0	103.2	102.6	103.4	104.1	104.2
Dissolved Oxygen (+/- 10%)	mg/L	11.91	11.86	12.00	11.92	11.91	11.99	11.96
Eh / ORP (+/- 10)	MeV	-42.7	-38.9	-36.6	-28.7	-21.5	-16.9	-16.3
Specific Conductivity (+/- 3%)	mS/cm^c	0.631	0.593	0.586	0.586	0.586	0.583	0.582
Conductivity (+/- 3%)	mS/cm	0.434	0.409	0.402	0.405	0.406	0.406	0.406
pH (+/- 0.1)	pH unit	8.17	8.20	8.19	8.15	8.16	8.16	8.17
Temp (+/- 0.5)	C°	8.61	8.55	8.71	8.82	8.92	9.11	9.19
Color	Visual	Clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: * Water coming out very forcefully w/ lots of bubbles, adjusted pump, no change, very high DO readings *

Sampled @ 1020

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-29 Date: 3/15/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-29 031518 QA/QC Collected? DUP-02 031518

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	~~67.70~~ 71.15	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	67.70	feet
4. C = Column of Water in Well:	3.47	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.56	gal
6. 3(V) = Target Purge Volume	1.68	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100Q

Parameter	Units	Readings							
Time	24 hr	1040	1045	1050	1055	1100	1105	1110	1115
Water Level (0.33)	feet	67.80	67.82	67.82	67.82	67.82	67.82	67.81	67.81
Volume Purged	gal	0	0.2	0.40	0.60	0.80	1.10	1.30	1.50
Flow Rate	mL/min	200	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	68.9	42.1	73.4	25.4	20.4	9.8	8.21	8.11
Dissolved Oxygen (+/- 10%)	%	62.4	61.6	60.9	64.0	65.5	65.3	65.1	66.2
Dissolved Oxygen (+/- 10%)	mg/L	7.34	7.18	6.99	7.28	7.43	7.34	7.32	7.42
Eh / ORP (+/- 10)	MeV	12.9	12.9	8.8	1.6	2.2	2.8	1.9	2.8
Specific Conductivity (+/- 3%)	mS/cm^c	0.601	0.611	0.625	0.607	0.596	0.588	0.587	0.584
Conductivity (+/- 3%)	mS/cm	0.409	0.418	0.437	0.429	0.422	0.419	0.420	0.420
pH (+/- 0.1)	pH unit	7.91	7.90	7.86	7.84	7.84	7.81	7.80	7.79
Temp (+/- 0.5)	C°	8.22	8.58	9.24	9.66	9.74	9.97	10.17	10.30
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No	No

Comments: Sampled @ 1115

* Duplicate *

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-30 Date: 3/15/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-30 031518 QA/QC Collected? NO

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	91.06	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	65.35	feet
4. C = Column of Water in Well:	25.65	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.18	gal
6. 3(V) = Target Purge Volume	12.54	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

82-92 pump set @~87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / HACH 2100Q

Parameter	Units	Readings						
Time	24 hr	800	805	810	815	820	825	830
Water Level (0.33)	feet	65.50	65.50	65.50	65.50	65.50	65.50	65.50
Volume Purged	gal	0	0.25	0.40	0.60	0.80	1.00	1.25
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	5.68	3.53	3.23	3.11	3.03	3.01	3.12
Dissolved Oxygen (+/- 10%)	%	29.7	5.7	2.9	2.2	2.0	1.8	1.7
Dissolved Oxygen (+/- 10%)	mg/L	3.65	0.66	0.34	0.26	0.23	0.20	0.19
Eh / ORP (+/- 10)	MeV	-5.9	-79.0	-104.3	-114.3	-122.1	-125.0	-122.8
Specific Conductivity (+/- 3%)	mS/cm^c	0.214	0.240	0.246	0.254	0.269	0.296	0.310
Conductivity (+/- 3%)	mS/cm	0.143	0.166	0.171	0.177	0.188	0.206	0.212
pH (+/- 0.1)	pH unit	8.75	8.69	8.63	8.60	8.55	8.53	8.54
Temp (+/- 0.5)	C°	7.66	8.85	9.08	9.22	9.24	9.27	9.40
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: Sampled @ 0830

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-31 Date: 3/15/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-31 031518 QA/QC Collected? -

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	91.76	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	67.20	feet
4. C = Column of Water in Well:	24.5	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	3.99	gal
6. 3(V) = Target Purge Volume	12.00	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

82-92 pump set @ ~87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100 Q

Parameter	Units	Readings					
Time	24 hr	850	855	900	905	910	915
Water Level (0.33)	feet	67.41	67.41	67.41	67.41	67.41	67.40
Volume Purged	gal	0	0.2	0.45	0.60	0.80	1.10
Flow Rate	mL/min	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	6.57	3.41	3.22	3.12	3.03	2.95
Dissolved Oxygen (+/- 10%)	%	66.7	2.9	2.30	1.7	1.7	1.6
Dissolved Oxygen (+/- 10%)	mg/L	8.50	0.35	0.27	0.19	0.19	0.17
Eh / ORP (+/- 10)	MeV	-57.3	-132.6	-137.9	-154.3	-155.7	-161.7
Specific Conductivity (+/- 3%)	mS/cm^c	0.237	0.369	0.373	0.379	0.380	0.381
Conductivity (+/- 3%)	mS/cm	0.146	0.250	0.254	0.259	0.259	0.261
pH (+/- 0.1)	pH unit	8.31	8.32	8.31	8.32	8.33	8.31
Temp (+/- 0.5)	C°	7.21	8.16	8.28	8.49	8.43	8.35
Color	Visual	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No

Comments: Sampled @ 915

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-32 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-32 031418 QA/QC Collected? Dup-01 031418

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	~~91.61~~	feet	
2. D = Riser Diameter (I.D.):	0.17	feet	
3. W = Depth to Water:	65.57	feet	
4. C = Column of Water in Well:	26.04	feet	
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.2	gal	
6. 3(V) = Target Purge Volume	12.75	gal	

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Set pump @ ~87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556/HACH 2100Q

Parameter	Units	Readings						
Time	24 hr	1045	1050	1055	1100	1105	1110	1115
Water Level (0.33)	feet	65.67	65.67	65.67	65.67	65.67	65.67	65.66
Volume Purged	gal	0	0.25	0.50	0.70	0.96	1.1	1.30
Flow Rate	mL/min	200	200	210	220	220	220	220
Turbidity (+/- 10%)	NTU	6.92	6.03	3.86	3.66	1.68	1.41	1.36
Dissolved Oxygen (+/- 10%)	%	57.4	28.6	9.6	4.3	2.4	2.3	2.2
Dissolved Oxygen (+/- 10%)	mg/L	6.77	3.33	1.10	0.48	0.27	0.26	0.25
Eh / ORP (+/- 10)	MeV	-37.0	-42.0	-71.5	-92.2	-102.1	-103.5	-106.4
Specific Conductivity (+/- 3%)	mS/cm^c	0.217	0.226	0.264	0.301	0.329	0.330	0.333
Conductivity (+/- 3%)	mS/cm	0.150	0.158	0.186	0.210	0.230	0.235	0.239
pH (+/- 0.1)	pH unit	8.11	8.01	7.95	7.93	7.95	7.97	7.97
Temp (+/- 0.5)	C°	8.89	9.29	9.72	9.77	9.96	9.99	10.18
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: Sampled @ 1115

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-33 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-33 03/14/18 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	92.27	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	65.65	feet
4. C = Column of Water in Well:	26.62	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	4.34	gal
6. 3(V) = Target Purge Volume	13.01	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Pump set @ ~87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / HACH 2100Q

Parameter	Units	Readings						
Time	24 hr	1150	1155	1200	1205	1210	1215	1220
Water Level (0.33)	feet	65.72	65.72	65.72	65.72	65.70	65.70	65.70
Volume Purged	gal	0	0.20	0.40	0.60	0.80	1.00	1.20
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	15.5	13.2	21.5	16.3	20.0	12.4	11.1
Dissolved Oxygen (+/- 10%)	%	60.1	52.3	32.5	24.9	21.3	18.2	17.1
Dissolved Oxygen (+/- 10%)	mg/L	8.65	6.17	3.73	2.79	2.39	2.04	1.94
Eh / ORP (+/- 10)	MeV	-48.9	-34.5	-41.2	-45.0	-47.2	-49.0	-49.6
Specific Conductivity (+/- 3%)	mS/cm[c]	0.334	0.356	0.376	0.388	0.391	0.394	0.395
Conductivity (+/- 3%)	mS/cm	0.226	0.242	0.264	0.277	0.281	0.283	0.283
pH (+/- 0.1)	pH unit	8.10	7.89	8.01	8.00	8.00	8.00	8.00
Temp (+/- 0.5)	C°	8.04	7.97	9.95	10.04	10.20	10.16	10.13
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments: Sampled @ 1235

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-33 Date: 3/14/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-33 03M18 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	See prev feet	
2. D = Riser Diameter (I.D.):	- feet	
3. W = Depth to Water:	- feet	
4. C = Column of Water in Well:	- feet	
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	- gal	
6. 3(V) = Target Purge Volume	- gal	

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1225	1230	1235				
Water Level (0.33)	feet	65.70	65.70	65.70				
Volume Purged	gal	1.40	1.60	1.80				
Flow Rate	mL/min	200	200	200				
Turbidity (+/- 10%)	NTU	9.56	9.22	9.18				
Dissolved Oxygen (+/- 10%)	%	16.8	17.0	16.8				
Dissolved Oxygen (+/- 10%)	mg/L	1.90	1.90	1.89				
Eh / ORP (+/- 10)	MeV	-50.1	-50.5	-49.9				
Specific Conductivity (+/- 3%)	mS/cm^c	0.396	0.397	0.398				
Conductivity (+/- 3%)	mS/cm	0.285	0.285	0.285				
pH (+/- 0.1)	pH unit	7.99	7.99	7.99				
Temp (+/- 0.5)	C°	10.22	10.22	10.28				
Color	Visual	clear	clear	clear				
Odor	Olfactory	No	No	No				

Comments:

Sampled @ 1235

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-34 Date: 3/13/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-34 071318 QA/QC Collected? no

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	88.19	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	63.16	feet
4. C = Column of Water in Well:	25.03	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	4.07	gal
6. 3(V) = Target Purge Volume	12.2	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

82-92 Pump Set @ ~87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / ~~Hach~~ Hach 2100Q

Parameter	Units	Readings							
Time	24 hr	1314	1319	1324	1329	1334	1339	1344	1349
Water Level (0.33)	feet	63.20	63.20	63.20	63.20	63.20	63.20	63.20	63.20
Volume Purged	gal	0	0.3	0.60	0.90	1.40	1.70	2.00	2.40
Flow Rate	mL/min	250	250	250	250	250	250	250	250
Turbidity (+/- 10%)	NTU	9.77	6.03	5.81	5.15	5.93	5.80	5.70	5.63
Dissolved Oxygen (+/- 10%)	%	63.1	9.60	7.3	4.3	3.4	3.0	2.9	2.9
Dissolved Oxygen (+/- 10%)	mg/L	7.66	1.12	0.86	0.50	0.40	0.36	0.34	0.34
Eh / ORP (+/- 10)	MeV	111.6	93.1	84.8	63.2	40.6	31.6	26.1	25.0
Specific Conductivity (+/- 3%)	mS/cm[c]	0.316	0.339	0.343	0.344	0.343	0.341	0.341	0.339
Conductivity (+/- 3%)	mS/cm	0.209	0.236	0.237	0.241	0.237	0.237	0.237	0.234
pH (+/- 0.1)	pH unit	7.40	7.46	7.47	7.44	7.40	7.40	7.37	7.37
Temp (+/- 0.5)	C°	7.16	~~7.46~~ 9.03	8.79	9.33	8.90	9.06	8.82	8.79
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No	No

Comments: Sampled @ 1349

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-35 Date: 3/13/18

Samplers: Ross McCredy Alex Golden

Sample Number: MW-35 031318 QA/QC Collected? -

Purging / Sampling Method: Bladder Pump/Dedicated Tubing

1. L = Well Depth:	92.30	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	62.88	feet
4. C = Column of Water in Well:	29.42	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.80	gal
6. 3(V) = Target Purge Volume	14.38	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

82.92 Pump set @ 87'

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI 556 / Hach 2100

Parameter	Units	Readings							
Time	24 hr	1200	1205	1210	1215	1220	1225	1230	1235
Water Level (0.33)	feet	63.00	63.01	63.01	63.01	63.01	63.01	63.01	63.01
Volume Purged	gal	0	0.3	0.60	0.90	1.1	1.3	1.6	1.9
Flow Rate	mL/min	250	250	250	250	250	250	250	250
Turbidity (+/- 10%)	NTU	17.0	14.4	11.9	12.8	14.0	11.2	11.2	11.0
Dissolved Oxygen (+/- 10%)	%	36.7	17.0	13.2	12.2	11.4	11.0	11.3	11.6
Dissolved Oxygen (+/- 10%)	mg/L	4.27	2.03	1.49	1.40	1.31	1.26	1.30	1.32
Eh / ORP (+/- 10)	MeV	142.6	111.7	91.7	79.5	71.1	65.7	60.4	57.1
Specific Conductivity (+/- 3%)	mS/cm[c]	0.254	0.295	0.313	0.316	0.314	0.313	0.313	0.313
Conductivity (+/- 3%)	mS/cm	0.175	0.208	0.229	0.224	0.220	0.218	0.217	0.218
pH (+/- 0.1)	pH unit	6.73	7.28	7.51	7.54	7.50	7.49	7.46	7.46
Temp (+/- 0.5)	C°	8.69	9.49	9.94	9.82	9.33	9.13	9.04	9.16
Color	Visual	clear	clear	clear	clear	Clear	clear	clear	Clear
Odor	Olfactory	No	No	No	NO	NO	No	No	No

Comments:

Sampled @ 1235

* Noticed Sulfur odor during Sampling

APPENDIX B: Field Calibration Forms

Calibration Log

Date:	3/13/18		Time:	1045		Instrument:	YSI 556	
	PH_1	7.03	->	7.00	ORP	220.4	->	240.1
	PH_2	10.12	->	10.00	Cond.	1.420	->	1.413
	PH_3	4.09	->	4.01	Turb.	-	->	-
Date:	3/14		Time:	730		Instrument:	YSI 556	
	PH_1	7.03	->	7.00	ORP	275.8	->	240.0
	PH_2	4.06	->	4.00	Cond.	1.200	->	1.413
	PH_3	9.59	->	10.00	Turb.	—	->	—
Date:	3/15/18		Time:	0730		Instrument:	YSI 556	
	PH_1	7.09	->	7.02	ORP	261.1	->	240.0
	PH_2	4.10	->	4.01	Cond.	1.212	->	1.413
	PH_3	10.03	->	10.00	Turb.	—	->	—
Date:			Time:			Instrument:		
	PH_1		->		ORP		->	
	PH_2		->		Cond.		->	
	PH_3		->		Turb.		->	
Date:			Time:			Instrument:		
	PH_1		->		ORP		->	
	PH_2		->		Cond.		->	
	PH_3		->		Turb.		->	
Date:			Time:			Instrument:		
	PH_1		->		ORP		->	
	PH_2		->		Cond.		->	
	PH_3		->		Turb.		->	

APPENDIX C: Hydraulic Gradient and Velocity Calculations

March 2018 Quarterly Monitoring Report
The Defense National Stockpile Center Scotia Depot
Appendix C Hydraulic Gradient and Velocity Calculations

Hydraulic Gradient Calculation

$$hydraulic\ gradient = \frac{change\ in\ groundwater\ elevation}{change\ in\ distance} = \frac{\Delta h}{\Delta L}$$

Dec 2017 Data		GW Elevation (ft)	Delta Elevation (ft)	Delta Distance (ft)	Gradient	Average Gradient (ft/ft)
Pair 1	MW-25	224.49	1.23	540	0.002278	**0.003092**
	MW-26	223.26				
Pair 2	GEP-3	225.43	1.3	420	0.003095	
	MW-13	224.13				
Pair 3	MW-17	226.04	1.6	410	0.003902	
	MW-28	224.44				

Groundwater Darcy Velocity

$$Darcy\ Velocty = K \times hydraulic\ gradient = K \times \frac{\Delta h}{\Delta L}$$

Low Hydraulic Conductivity (K) (ft/day)	15.66
High Hydraulic Conductivity (K) (ft/day)	193.8

Darcy Velocity Low (ft/day)	0.05
Darcy Velocity High (ft/day)	0.60

Seepage Velocity

$$\text{Seepage } Velocty = \frac{K \times hydraulic\ gradient}{n} = \frac{Darcy\ Velocity}{n}$$

Porosity (n)	0.4

Seepage Velocity Low (ft/day)	**0.12**
Seepage Velocity High (ft/day)	**1.50**

APPENDIX D: Laboratory Reports

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

March 30, 2018

Mr. John Santacroce
AECOM - LATHAM NY
40 British American Blvd.
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**2302803**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN032|2015-SCOTIA NAVY DEPOT-**

Dear Mr. Santacroce:

Enclosed are the analytical results for samples received by the laboratory on Friday, March 16, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

CC: Ms. Kelly Lurie , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

March 30, 2018

Mr. John Santacroce
AECOM - LATHAM NY
40 British American Blvd.
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**2302803**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN032|2015-SCOTIA NAVY DEPOT-**

Dear Mr. Santacroce:

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Kelly Lurie , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302803001	MW-30 031518	Ground Water	3/15/2018 08:30	3/16/2018 10:55	Collected by Client
2302803002	MW-31 031518	Ground Water	3/15/2018 09:15	3/16/2018 10:55	Collected by Client
2302803003	MW-28 031518	Ground Water	3/15/2018 10:20	3/16/2018 10:55	Collected by Client
2302803004	MW-29 031518	Ground Water	3/15/2018 11:15	3/16/2018 10:55	Collected by Client
2302803005	DUP-02 031518	Ground Water	3/15/2018 00:00	3/16/2018 10:55	Collected by Client

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803001** Date Collected: 3/15/2018 08:30 Matrix: Ground Water

Sample ID: **MW-30 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
Trichloroethene	9.8		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:15	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C			3/27/18 20:15	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			3/27/18 20:15	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/27/18 20:15	TMP	A
Toluene-d8 (S)	98		%	89 - 112			SW846 8260C			3/27/18 20:15	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	31.1		ug/L	1.0	0.50	0.25	RSK 175			3/26/18 02:18	EGO	C
Ethene	2.2		ug/L	1.5	0.75	0.31	RSK 175			3/26/18 02:18	EGO	C
Methane	5860		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 02:18	EGO	C
WET CHEMISTRY												
Alkalinity, Total	141	1	mg/L	5	5	0.8	S2320B-97			3/22/18 06:47	MSA	H
Chloride	43.6		mg/L	2.0	0.50	0.16	EPA 300.0			3/17/18 07:45	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/17/18 07:45	CHW	G
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0			3/17/18 07:45	CHW	G
Total Organic Carbon (TOC)	50.9		mg/L	10.0	5.0	1.8	S5310B-00			3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803002** Date Collected: 3/15/2018 09:15 Matrix: Ground Water

Sample ID: **MW-31 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
cis-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
Trichloroethene	19.1		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 20:38	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118			SW846 8260C			3/27/18 20:38	TMP	A
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C			3/27/18 20:38	TMP	A
Dibromofluoromethane (S)	99.6		%	80 - 119			SW846 8260C			3/27/18 20:38	TMP	A
Toluene-d8 (S)	99		%	89 - 112			SW846 8260C			3/27/18 20:38	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	2.6		ug/L	1.0	0.50	0.25	RSK 175			3/26/18 02:34	EGO	C
Ethene	1.6		ug/L	1.5	0.75	0.31	RSK 175			3/26/18 02:34	EGO	C
Methane	34.4		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 02:34	EGO	C
WET CHEMISTRY												
Alkalinity, Total	143	1	mg/L	5	5	0.8	S2320B-97			3/22/18 06:56	MSA	H
Chloride	50.6		mg/L	2.0	0.50	0.16	EPA 300.0			3/17/18 08:01	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/17/18 08:01	CHW	G
Sulfate	6.7		mg/L	2.0	0.50	0.20	EPA 300.0			3/17/18 08:01	CHW	G
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	S5310B-00			3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803003** Date Collected: 3/15/2018 10:20 Matrix: Ground Water

Sample ID: **MW-28 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1-Dichloroethane	0.69J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
Tetrachloroethene	23.2		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1,1-Trichloroethane	5.6		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
Trichloroethene	153		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:01	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C			3/27/18 21:01	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			3/27/18 21:01	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/27/18 21:01	TMP	A
Toluene-d8 (S)	99		%	89 - 112			SW846 8260C			3/27/18 21:01	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 02:50	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 02:50	EGO	C
Methane	0.25U	U,1	ug/L	0.50	0.25	0.13	RSK 175			3/26/18 02:50	EGO	C
WET CHEMISTRY												
Alkalinity, Total	360	2	mg/L	5	5	0.8	S2320B-97			3/22/18 07:07	MSA	H
Chloride	20.9		mg/L	2.0	0.50	0.16	EPA 300.0			3/17/18 08:17	CHW	G
Nitrate-N	1.5		mg/L	0.20	0.060	0.020	EPA 300.0			3/17/18 08:17	CHW	G
Sulfate	20.2		mg/L	2.0	0.50	0.20	EPA 300.0			3/17/18 08:17	CHW	G
Total Organic Carbon (TOC)	0.36J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803004** Date Collected: 3/15/2018 11:15 Matrix: Ground Water

Sample ID: **MW-29 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.72J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1-Dichloroethane	0.91J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1-Dichloroethene	0.77J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
cis-1,2-Dichloroethene	5.4		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
trans-1,2-Dichloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
Tetrachloroethene	38.9		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1,1-Trichloroethane	13.2		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
Trichloroethene	207		ug/L	5.0	3.8	1.7	SW846 8260C			3/28/18 18:43	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 21:23	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			3/27/18 21:23	TMP	A
1,2-Dichloroethane-d4 (S)	100		%	81 - 118			SW846 8260C			3/28/18 18:43	TMP	B
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			3/28/18 18:43	TMP	B
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			3/27/18 21:23	TMP	A
Dibromofluoromethane (S)	96.5		%	80 - 119			SW846 8260C			3/28/18 18:43	TMP	B
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/27/18 21:23	TMP	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C			3/27/18 21:23	TMP	A
Toluene-d8 (S)	97.9		%	89 - 112			SW846 8260C			3/28/18 18:43	TMP	B
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 03:22	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 03:22	EGO	C
Methane	0.25U	U	ug/L	0.50	0.25	0.13	RSK 175			3/26/18 03:22	EGO	C
WET CHEMISTRY												
Alkalinity, Total	360	1	mg/L	5	5	0.8	S2320B-97			3/22/18 07:19	MSA	H
Chloride	23.4		mg/L	2.0	0.50	0.16	EPA 300.0			3/17/18 08:32	CHW	G
Nitrate-N	1.3		mg/L	0.20	0.060	0.020	EPA 300.0			3/17/18 08:32	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0			3/17/18 08:32	CHW	G
Total Organic Carbon (TOC)	0.38J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/21/18 12:51	PAG	E

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803004** Date Collected: 3/15/2018 11:15 Matrix: Ground Water

Sample ID: **MW-29 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803005** Date Collected: 3/15/2018 00:00 Matrix: Ground Water

Sample ID: **DUP-02 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1-Dichloroethane	0.96J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1-Dichloroethene	0.84J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
cis-1,2-Dichloroethene	5.7		ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
trans-1,2-Dichloroethene	0.48J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
Tetrachloroethene	40.0		ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1,1-Trichloroethane	13.1		ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
Trichloroethene	207		ug/L	5.0	3.8	1.7	SW846 8260C			3/29/18 17:46	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/28/18 19:06	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			3/28/18 19:06	TMP	A
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C			3/29/18 17:46	DD	A
4-Bromofluorobenzene (S)	90.1		%	85 - 114			SW846 8260C			3/29/18 17:46	DD	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			3/28/18 19:06	TMP	A
Dibromofluoromethane (S)	96		%	80 - 119			SW846 8260C			3/28/18 19:06	TMP	A
Dibromofluoromethane (S)	91.3		%	80 - 119			SW846 8260C			3/29/18 17:46	DD	A
Toluene-d8 (S)	98.8		%	89 - 112			SW846 8260C			3/28/18 19:06	TMP	A
Toluene-d8 (S)	83.8	2	%	89 - 112			SW846 8260C			3/29/18 17:46	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 03:56	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 03:56	EGO	C
Methane	0.25U	U	ug/L	0.50	0.25	0.13	RSK 175			3/26/18 03:56	EGO	C
WET CHEMISTRY												
Alkalinity, Total	356	1	mg/L	5	5	0.8	S2320B-97			3/22/18 08:18	MSA	H
Chloride	22.9		mg/L	2.0	0.50	0.16	EPA 300.0			3/17/18 08:48	CHW	G
Nitrate-N	1.3		mg/L	0.20	0.060	0.020	EPA 300.0			3/17/18 08:48	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0			3/17/18 08:48	CHW	G
Total Organic Carbon (TOC)	0.50J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/21/18 12:51	PAG	E

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803005** Date Collected: 3/15/2018 00:00 Matrix: Ground Water

Sample ID: **DUP-02 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302803001	1	MW-30 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803002	1	MW-31 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803003	1	MW-28 031518	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 200 and the upper control limit is 20.				
2302803003	2	MW-28 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803004	1	MW-29 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803005	1	DUP-02 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803005	2	DUP-02 031518	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 83.8 and the control limits were 89 to 112. This result was reported at a dilution of 5.				

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/48589 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2302803001, 2302803002, 2302803003, 2302803004, 2302803005

METHOD BLANK: 2710612

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.25U	ug/L	0.50

SAMPLE DUPLICATE: 2710644 ORIGINAL: 2302814001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	26.64	ug/L	27.9	4.62	20

SAMPLE DUPLICATE: 2710613 ORIGINAL: 2302814004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	9.76	ug/L	10.05	2.93	20
Ethene	3	ug/L	3.09	2.96	20
Methane	515.33	ug/L	517.62	.44	20

SAMPLE DUPLICATE: 2710614 ORIGINAL: 2302803003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	0	ug/L	.23	NC	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/46317 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2302803001, 2302803002, 2302803003, 2302803004

METHOD BLANK: 2711603

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	101	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97.4	%	80 - 119
Toluene-d8 (S)	98.8	%	89 - 112

LABORATORY CONTROL SAMPLE: 2711604

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	104	ug/L	20	20.8	72 - 136
1,1-Dichloroethane	101	ug/L	20	20.2	77 - 125
1,2-Dichloroethane	97.5	ug/L	20	19.5	73 - 128
1,1-Dichloroethene	108	ug/L	20	21.7	71 - 131
cis-1,2-Dichloroethene	96.9	ug/L	20	19.4	78 - 123
trans-1,2-Dichloroethene	107	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	99.3	ug/L	20	19.9	78 - 124
1,1,2,2-Tetrachloroethane	93.9	ug/L	20	18.8	71 - 121
Tetrachloroethene	103	ug/L	20	20.5	74 - 129
Toluene	103	ug/L	20	20.6	80 - 121
1,1,1-Trichloroethane	104	ug/L	20	20.7	74 - 131
1,1,2-Trichloroethane	96.4	ug/L	20	19.3	80 - 119
Trichloroethene	98.5	ug/L	20	19.7	79 - 123

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	101	ug/L	20	20.2	58 - 137
1,2-Dichloroethane-d4 (S)	101	%			81 - 118
4-Bromofluorobenzene (S)	98.8	%			85 - 114
Dibromofluoromethane (S)	93.9	%			80 - 119
Toluene-d8 (S)	96.4	%			89 - 112

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/46331 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2302803004, 2302803005

METHOD BLANK: 2712521

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	103	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97.3	%	80 - 119
Toluene-d8 (S)	100	%	89 - 112

LABORATORY CONTROL SAMPLE: 2712522

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	109	ug/L	20	21.8	72 - 136
1,1-Dichloroethane	106	ug/L	20	21.2	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.6	73 - 128
1,1-Dichloroethene	109	ug/L	20	21.7	71 - 131
cis-1,2-Dichloroethene	105	ug/L	20	21.0	78 - 123
trans-1,2-Dichloroethene	107	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	113	ug/L	20	22.5	78 - 124
1,1,2,2-Tetrachloroethane	102	ug/L	20	20.3	71 - 121
Tetrachloroethene	106	ug/L	20	21.3	74 - 129
Toluene	111	ug/L	20	22.2	80 - 121
1,1,1-Trichloroethane	104	ug/L	20	20.8	74 - 131
1,1,2-Trichloroethane	101	ug/L	20	20.2	80 - 119
Trichloroethene	98.7	ug/L	20	19.7	79 - 123

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	106	ug/L	20	21.1	58 - 137
1,2-Dichloroethane-d4 (S)	102	%			81 - 118
4-Bromofluorobenzene (S)	103	%			85 - 114
Dibromofluoromethane (S)	94.2	%			80 - 119
Toluene-d8 (S)	97.2	%			89 - 112

MATRIX SPIKE: 2713567 DUPLICATE: 2713568 ORIGINAL: 2303042002

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	23.436	21.9495	117	110	72 - 136	6.55	30
1,1-Dichloroethane	0	ug/L	20	22.406	21.957	112	110	77 - 125	2.02	30
1,2-Dichloroethane	0	ug/L	20	20.5628	21.1506	103	106	73 - 128	2.82	30
1,1-Dichloroethene	0	ug/L	20	23.2914	22.7663	116	114	71 - 131	2.28	30
cis-1,2-Dichloroethene	0	ug/L	20	26.4703	23.4061	132*	117	78 - 123	12.3	30
trans-1,2-Dichloroethene	0	ug/L	20	22.9655	22.5915	115	113	75 - 124	1.64	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	24.0846	23.2546	120	116	78 - 124	3.51	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.0191	20.7025	100	104	71 - 121	3.36	30
Tetrachloroethene	0	ug/L	20	22.4523	20.6464	112	103	74 - 129	8.38	30
Toluene	0	ug/L	20	23.5582	22.4824	118	112	80 - 121	4.67	30
1,1,1-Trichloroethane	0	ug/L	20	22.2467	21.3872	111	107	74 - 131	3.94	30
1,1,2-Trichloroethane	0	ug/L	20	21.7256	21.2408	109	106	80 - 119	2.26	30
Trichloroethene	0	ug/L	20	23.084	20.9931	115	105	79 - 123	9.49	30
Vinyl Chloride	0	ug/L	20	21.9295	22.0363	110	110	58 - 137	.49	30
1,2-Dichloroethane-d4 (S)	102	%				102	96.9	81 - 118		
4-Bromofluorobenzene (S)	101	%				101	98.5	85 - 114		
Dibromofluoromethane (S)	96.3	%				96.3	92.4	80 - 119		
Toluene-d8 (S)	98.9	%				98.9	95.2	89 - 112		

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/46374 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2302803005

METHOD BLANK: 2714127

Parameter	Blank Result	Units	Reporting Limit
Trichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	102	%	81 - 118
4-Bromofluorobenzene (S)	89.8	%	85 - 114
Dibromofluoromethane (S)	88.6	%	80 - 119
Toluene-d8 (S)	83.8	%	89 - 112

LABORATORY CONTROL SAMPLE: 2714128

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Trichloroethene	99.5	ug/L	20	19.9	79 - 123
1,1,1,2-Tetrachloroethane	97.2	ug/L	20	19.4	78 - 124
1,1,1-Trichloroethane	117	ug/L	20	23.5	74 - 131
1,1,2,2-Tetrachloroethane	94.3	ug/L	20	18.9	71 - 121
1,1,2-Trichloroethane	97.4	ug/L	20	19.5	80 - 119
1,1-Dichloroethane	107	ug/L	20	21.4	77 - 125
1,1-Dichloroethene	104	ug/L	20	20.7	71 - 131
1,2-Dichloroethane	103	ug/L	20	20.6	73 - 128
Carbon Tetrachloride	112	ug/L	20	22.4	72 - 136
Tetrachloroethene	100	ug/L	20	20.0	74 - 129
Toluene	107	ug/L	20	21.3	80 - 121
Vinyl Chloride	103	ug/L	20	20.6	58 - 137
cis-1,2-Dichloroethene	105	ug/L	20	20.9	78 - 123

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

trans-1,2-Dichloroethene	109	ug/L	20	21.7	75 - 124
1,2-Dichloroethane-d4 (S)	98.6	%			81 - 118
4-Bromofluorobenzene (S)	89.8	%			85 - 114
Dibromofluoromethane (S)	89.9	%			80 - 119
Toluene-d8 (S)	82.3*	%			89 - 112

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201685 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2302803001, 2302803002, 2302803003, 2302803004, 2302803005

METHOD BLANK: 2707276

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2707278

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	99.6	mg/L	20	19.9	87 - 111
Nitrate-N	97.2	mg/L	2.5	2.4	88 - 111
Sulfate	99.9	mg/L	20	20.0	87 - 112

METHOD BLANK: 2707307

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201772 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2302803001, 2302803002, 2302803003, 2302803004, 2302803005

METHOD BLANK: 2708215

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2708220 ORIGINAL: 2302654001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	93.71002	mg/L	88.48551	5.74	20

METHOD BLANK: 2708223

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708224 ORIGINAL: 2302654002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	84.82954	mg/L	85.60704	.91	20

METHOD BLANK: 2708227

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708228 ORIGINAL: 2302814001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Alkalinity, Total	196.13504	mg/L	200.7757	2.34	20

METHOD BLANK: 2708231

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708232 ORIGINAL: 2302818001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	139.54758	mg/L	133.6496	4.32	20

METHOD BLANK: 2708235

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708236 ORIGINAL: 2302825001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	57.80482	mg/L	54.82222	5.3	20

METHOD BLANK: 2708239

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708240 ORIGINAL: 2302938001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	226.3714	mg/L	241.91228	6.64	20

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708243

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708244 ORIGINAL: 2302938002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	475.97891	mg/L	468.74094	1.53	20

METHOD BLANK: 2708247

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708248 ORIGINAL: 2302938007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	66.30558	mg/L	67.44469	1.7	20

METHOD BLANK: 2708251

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708252 ORIGINAL: 2303108001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	129.51073	mg/L	128.01349	1.16	20

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708255

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708256 ORIGINAL: 2303124001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	122.91826	mg/L	109.79333	11.3	20

METHOD BLANK: 2708259

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708260 ORIGINAL: 2303153001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	9.70008	mg/L	11.03795	12.9	20

METHOD BLANK: 2708263

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708264 ORIGINAL: 2303153003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	12.07326	mg/L	10.40392	14.9	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708943

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201817 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2302803001, 2302803002, 2302803003, 2302803004, 2302803005

METHOD BLANK: 2708692

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2708693

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.7	mg/L	1	0.97J	85 - 115

MATRIX SPIKE: 2708694 DUPLICATE: 2708695 ORIGINAL: 2302803003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.357	mg/L	6	6.681	6.733	105	106	85 - 115	.78	20

MATRIX SPIKE: 2708696 DUPLICATE: 2708697 ORIGINAL: 2303135001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.2	mg/L	6	7.215	7.306	100	102	85 - 115	1.25	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2302803001	MW-30 031518			EPA 300.0	WETC/201685
2302803002	MW-31 031518			EPA 300.0	WETC/201685
2302803003	MW-28 031518			EPA 300.0	WETC/201685
2302803004	MW-29 031518			EPA 300.0	WETC/201685
2302803005	DUP-02 031518			EPA 300.0	WETC/201685
2302803001	MW-30 031518			S2320B-97	WETC/201772
2302803002	MW-31 031518			S2320B-97	WETC/201772
2302803003	MW-28 031518			S2320B-97	WETC/201772
2302803004	MW-29 031518			S2320B-97	WETC/201772
2302803005	DUP-02 031518			S2320B-97	WETC/201772
2302803001	MW-30 031518			S5310B-00	WETC/201817
2302803002	MW-31 031518			S5310B-00	WETC/201817
2302803003	MW-28 031518			S5310B-00	WETC/201817
2302803004	MW-29 031518			S5310B-00	WETC/201817
2302803005	DUP-02 031518			S5310B-00	WETC/201817
2302803001	MW-30 031518			RSK 175	SVGC/48589
2302803002	MW-31 031518			RSK 175	SVGC/48589
2302803003	MW-28 031518			RSK 175	SVGC/48589
2302803004	MW-29 031518			RSK 175	SVGC/48589
2302803005	DUP-02 031518			RSK 175	SVGC/48589
2302803001	MW-30 031518			SW846 8260C	VOMS/46317
2302803002	MW-31 031518			SW846 8260C	VOMS/46317
2302803003	MW-28 031518			SW846 8260C	VOMS/46317
2302803004	MW-29 031518			SW846 8260C	VOMS/46317
2302803004	MW-29 031518			SW846 8260C	VOMS/46331
2302803005	DUP-02 031518			SW846 8260C	VOMS/46331

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2302803005	DUP-02 031518			SW846 8260C	VOMS/46374

ALS Environmental
34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #: 7400 8521 5564

230280 3

Co. Name: AECOM
Contact (Report to): Phone: 518 951 2200
Address: 40 British American BLVD Latham, NY

Bill to (if different than Report to): AECOM John Santacroce PO#: 60440641

Project Name/#: Scotia Navy Dept ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges. Date Required: Approved By:

Email? [✓] Y John.Santacroce@aecom.com
Fax? [ ] Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	TOC	RSK175	Alkalinity	Cl, SO4, NO3						
***Container Type						AG	AG	AG	P	P						
***Container Size						40	40	40	250	250						
*** Preservative						1	1	1	6	6						
						Enter Number of Containers Per Analysis										
1 MW-30 031518		3/15/18	830	G	GW	2	2	2	1	1						
2 MW-31 031518		3/15/18	915	G	GW	2	2	2	1	1						
3 MW-28 031518		3/15/18	1020	G	GW	2	2	2	1	1						
4 MW-29 031518		3/15/18	1115	G	GW	2	2	2	1	1						
5 Dup-02 031518	* Duplicate *	3/15/18	-	G	GW	2	2	2	1	1						
6																
7																
8																

Receipt Information (completed by Sample Receiving)
Performed by: INITIAL HERE
Cooler Temp: 3
Therm. ID: 318
No. of Coolers:
Notes:

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
	N	N	N	Y N	
	Y	Y	Y	Y	Y
	Custody seals Present?	(if present) Seals intact?	Received on ice?	COC/Labels complete/accurate?	Container in good condition?

SAMPLED BY (Please Print): Ross McCredy / Alek Golden

Project Comments: 3/15/18 1615

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Ross McCredy / AECOM	3/15/18		2 Brian MCGuirk / Paul Nw	3/15/18	1215
3 Brian MCGuirk	3/15/18	1700	4	3/16	1033
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] If yes, format type:
EDDs Required?
SDWA Forms? yes
State Samples Collected In? MD NJ NY PA
Other SEE QAPP
DOD Criteria Required? SEE QAPP

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite
**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

March 29, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**2302814**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN033|2015-SCOTIA NAVY DEPOT-**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Thursday, March 15, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

CC: Mr. John Santacroce , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

March 29, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**2302814**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN033|2015-SCOTIA NAVY DEPOT-**

Dear Ms. Lurie:

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. John Santacroce , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302814001	MW-26 031418	Ground Water	3/14/2018 08:55	3/15/2018 11:19	Collected by Client
2302814002	EB-1 031418	Ground Water	3/14/2018 09:00	3/15/2018 11:19	Collected by Client
2302814003	MW-24 031418	Ground Water	3/14/2018 10:15	3/15/2018 11:19	Collected by Client
2302814004	DUP-01 031418	Ground Water	3/14/2018 00:00	3/15/2018 11:19	Collected by Client
2302814005	MW-32 031418	Ground Water	3/14/2018 11:15	3/15/2018 11:19	Collected by Client
2302814006	MW-33 031418	Ground Water	3/14/2018 12:35	3/15/2018 11:19	Collected by Client
2302814007	MW-15 031418	Ground Water	3/14/2018 13:45	3/15/2018 11:19	Collected by Client

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814001** Date Collected: 3/14/2018 08:55 Matrix: Ground Water

Sample ID: **MW-26 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:41	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C			3/27/18 05:41	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			3/27/18 05:41	CJG	A
Dibromofluoromethane (S)	99.3		%	80 - 119			SW846 8260C			3/27/18 05:41	CJG	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C			3/27/18 05:41	CJG	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 00:21	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 00:21	EGO	A
Methane	26.6		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 00:21	EGO	A
WET CHEMISTRY												
Alkalinity, Total	196	1	mg/L	5	5	0.8	S2320B-97			3/22/18 08:07	MSA	P
Chloride	32.3		mg/L	2.0	0.50	0.16	EPA 300.0			3/16/18 07:02	CHW	M
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/16/18 07:02	CHW	M
Sulfate	10.6		mg/L	2.0	0.50	0.20	EPA 300.0			3/16/18 07:02	CHW	M
Total Organic Carbon (TOC)	5.8J	J	mg/L	10.0	5.0	1.8	S5310B-00			3/20/18 19:01	PAG	G

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814002** Date Collected: 3/14/2018 09:00 Matrix: Ground Water

Sample ID: **EB-1 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 02:39	CJG	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118	SW846 8260C			3/27/18 02:39	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			3/27/18 02:39	CJG	A
Dibromofluoromethane (S)	99.1		%	80 - 119	SW846 8260C			3/27/18 02:39	CJG	A
Toluene-d8 (S)	100		%	89 - 112	SW846 8260C			3/27/18 02:39	CJG	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814003** Date Collected: 3/14/2018 10:15 Matrix: Ground Water

Sample ID: **MW-24 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
Trichloroethene	2.0		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:04	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C			3/27/18 06:04	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			3/27/18 06:04	CJG	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/27/18 06:04	CJG	A
Toluene-d8 (S)	99.3		%	89 - 112			SW846 8260C			3/27/18 06:04	CJG	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 00:36	EGO	C
Ethene	1.0J	J	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 00:36	EGO	C
Methane	927		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 00:36	EGO	C
WET CHEMISTRY												
Alkalinity, Total	313	1	mg/L	5	5	0.8	S2320B-97			3/22/18 08:40	MSA	H
Chloride	60.8		mg/L	2.0	0.50	0.16	EPA 300.0			3/16/18 07:50	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/16/18 07:50	CHW	G
Sulfate	0.22J	J	mg/L	2.0	0.50	0.20	EPA 300.0			3/16/18 07:50	CHW	G
Total Organic Carbon (TOC)	44.1		mg/L	25.0	12.5	4.6	S5310B-00			3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814004** Date Collected: 3/14/2018 00:00 Matrix: Ground Water

Sample ID: **DUP-01 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
cis-1,2-Dichloroethene	0.64J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Trichloroethene	106		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/27/18 06:26	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 06:26	CJG	A
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C		3/27/18 06:26	CJG	A
Toluene-d8 (S)	99.5		%	89 - 112			SW846 8260C		3/27/18 06:26	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	9.8		ug/L	1.0	0.50	0.25	RSK 175		3/26/18 00:53	EGO	C
Ethene	3.0		ug/L	1.5	0.75	0.31	RSK 175		3/26/18 00:53	EGO	C
Methane	515		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 00:53	EGO	C
WET CHEMISTRY											
Alkalinity, Total	160	1	mg/L	5	5	0.8	S2320B-97		3/22/18 08:50	MSA	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 08:05	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 08:05	CHW	G
Sulfate	7.0		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 08:05	CHW	G
Total Organic Carbon (TOC)	2.7		mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814005** Date Collected: 3/14/2018 11:15 Matrix: Ground Water

Sample ID: **MW-32 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
cis-1,2-Dichloroethene	0.61J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
Trichloroethene	104		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 06:49	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C			3/27/18 06:49	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			3/27/18 06:49	CJG	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/27/18 06:49	CJG	A
Toluene-d8 (S)	99.7		%	89 - 112			SW846 8260C			3/27/18 06:49	CJG	A
LIGHT HYDROCARBON GASES												
Ethane	10.7		ug/L	1.0	0.50	0.25	RSK 175			3/26/18 01:30	EGO	C
Ethene	3.3		ug/L	1.5	0.75	0.31	RSK 175			3/26/18 01:30	EGO	C
Methane	583		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 01:30	EGO	C
WET CHEMISTRY												
Alkalinity, Total	162	1	mg/L	5	5	0.8	S2320B-97			3/22/18 09:00	MSA	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0			3/16/18 08:21	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/16/18 08:21	CHW	G
Sulfate	7.1		mg/L	2.0	0.50	0.20	EPA 300.0			3/16/18 08:21	CHW	G
Total Organic Carbon (TOC)	2.7		mg/L	1.0	0.50	0.18	S5310B-00			3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814006** Date Collected: 3/14/2018 12:35 Matrix: Ground Water

Sample ID: **MW-33 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:12	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C			3/27/18 07:12	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			3/27/18 07:12	CJG	A
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C			3/27/18 07:12	CJG	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C			3/27/18 07:12	CJG	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 01:46	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 01:46	EGO	C
Methane	6.1		ug/L	0.50	0.25	0.13	RSK 175			3/26/18 01:46	EGO	C
WET CHEMISTRY												
Alkalinity, Total	215	1	mg/L	5	5	0.8	S2320B-97			3/22/18 09:10	MSA	H
Chloride	23.0		mg/L	2.0	0.50	0.16	EPA 300.0			3/16/18 08:37	CHW	G
Nitrate-N	0.34		mg/L	0.20	0.060	0.020	EPA 300.0			3/16/18 08:37	CHW	G
Sulfate	11.6		mg/L	2.0	0.50	0.20	EPA 300.0			3/16/18 08:37	CHW	G
Total Organic Carbon (TOC)	0.83J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814007** Date Collected: 3/14/2018 13:45 Matrix: Ground Water

Sample ID: **MW-15 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
Tetrachloroethene	0.88J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1,1-Trichloroethane	3.2		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
Trichloroethene	87.8		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 07:35	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118			SW846 8260C			3/27/18 07:35	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			3/27/18 07:35	CJG	A
Dibromofluoromethane (S)	99.7		%	80 - 119			SW846 8260C			3/27/18 07:35	CJG	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C			3/27/18 07:35	CJG	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/26/18 02:02	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/26/18 02:02	EGO	C
Methane	0.18J	J	ug/L	0.50	0.25	0.13	RSK 175			3/26/18 02:02	EGO	C
WET CHEMISTRY												
Alkalinity, Total	223	1	mg/L	5	5	0.8	S2320B-97			3/22/18 09:21	MSA	H
Chloride	24.0		mg/L	2.0	0.50	0.16	EPA 300.0			3/16/18 08:52	CHW	G
Nitrate-N	0.70		mg/L	0.20	0.060	0.020	EPA 300.0			3/16/18 08:52	CHW	G
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0			3/16/18 08:52	CHW	G
Total Organic Carbon (TOC)	0.26J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302814001	1	MW-26 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814003	1	MW-24 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814004	1	DUP-01 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814005	1	MW-32 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814006	1	MW-33 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814007	1	MW-15 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/48589 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2302814001, 2302814003, 2302814004, 2302814005, 2302814006, 2302814007

METHOD BLANK: 2710612

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.25U	ug/L	0.50

SAMPLE DUPLICATE: 2710644 ORIGINAL: 2302814001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	26.64	ug/L	27.9	4.62	20

SAMPLE DUPLICATE: 2710613 ORIGINAL: 2302814004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	9.76	ug/L	10.05	2.93	20
Ethene	3	ug/L	3.09	2.96	20
Methane	515.33	ug/L	517.62	.44	20

SAMPLE DUPLICATE: 2710614 ORIGINAL: 2302803003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	0	ug/L	.23	NC	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/46312 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2302814001, 2302814002, 2302814003, 2302814004, 2302814005, 2302814006, 2302814007

METHOD BLANK: 2711286

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	104	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97.5	%	80 - 119
Toluene-d8 (S)	102	%	89 - 112

LABORATORY CONTROL SAMPLE: 2711287

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.3	72 - 136
1,1-Dichloroethane	100	ug/L	20	20.0	77 - 125
1,2-Dichloroethane	97.9	ug/L	20	19.6	73 - 128
1,1-Dichloroethene	111	ug/L	20	22.3	71 - 131
cis-1,2-Dichloroethene	96.7	ug/L	20	19.3	78 - 123
trans-1,2-Dichloroethene	108	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	96.5	ug/L	20	19.3	78 - 124
1,1,2,2-Tetrachloroethane	94.3	ug/L	20	18.9	71 - 121
Tetrachloroethene	101	ug/L	20	20.2	74 - 129
Toluene	102	ug/L	20	20.4	80 - 121
1,1,1-Trichloroethane	105	ug/L	20	20.9	74 - 131
1,1,2-Trichloroethane	95.4	ug/L	20	19.1	80 - 119
Trichloroethene	98.8	ug/L	20	19.8	79 - 123

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	100	ug/L	20	20.0	58 - 137
1,2-Dichloroethane-d4 (S)	98.8	%			81 - 118
4-Bromofluorobenzene (S)	99.9	%			85 - 114
Dibromofluoromethane (S)	95	%			80 - 119
Toluene-d8 (S)	97.4	%			89 - 112

MATRIX SPIKE: 2711288 DUPLICATE: 2711289 ORIGINAL: 2302814001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	21.8397	22.2235	109	111	72 - 136	1.74	30
1,1-Dichloroethane	0	ug/L	20	19.8483	20.7689	99.2	104	77 - 125	4.53	30
1,2-Dichloroethane	0	ug/L	20	19.1919	20.7097	96	104	73 - 128	7.61	30
1,1-Dichloroethene	0	ug/L	20	21.7959	22.6668	109	113	71 - 131	3.92	30
cis-1,2-Dichloroethene	0	ug/L	20	19.1956	20.3111	96	102	78 - 123	5.65	30
trans-1,2-Dichloroethene	0	ug/L	20	21.1856	22.2869	106	111	75 - 124	5.07	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	19.6971	20.3453	98.5	102	78 - 124	3.24	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	18.4568	19.2132	92.3	96.1	71 - 121	4.02	30
Tetrachloroethene	0	ug/L	20	20.2862	20.8551	101	104	74 - 129	2.77	30
Toluene	0	ug/L	20	20.1701	20.9252	101	105	80 - 121	3.67	30
1,1,1-Trichloroethane	0	ug/L	20	21.2263	21.9078	106	110	74 - 131	3.16	30
1,1,2-Trichloroethane	0	ug/L	20	19.3452	19.4187	96.7	97.1	80 - 119	.38	30
Trichloroethene	0	ug/L	20	19.7467	20.9011	98.7	105	79 - 123	5.68	30
Vinyl Chloride	0	ug/L	20	19.8249	21.647	99.1	108	58 - 137	8.79	30
1,2-Dichloroethane-d4 (S)	103	%				103	107	81 - 118		
4-Bromofluorobenzene (S)	98.2	%				98.2	101	85 - 114		
Dibromofluoromethane (S)	94.5	%				94.5	96.6	80 - 119		
Toluene-d8 (S)	96.2	%				96.2	96.2	89 - 112		

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201686 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2302814001, 2302814003, 2302814004, 2302814005, 2302814006, 2302814007

METHOD BLANK: 2707280

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.16J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2707282

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	103	mg/L	20	20.5	87 - 111
Nitrate-N	100	mg/L	2.5	2.5	88 - 111
Sulfate	103	mg/L	20	20.7	87 - 112

MATRIX SPIKE: 2707318 DUPLICATE: 2707319 ORIGINAL: 2302814001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Chloride	32.28	mg/L	40	69.44	67.28	92.9	87.5	87 - 111	3.16	15
Nitrate-N	0	mg/L	5	5.06	4.82	101	96.4	88 - 111	4.86	15
Sulfate	10.58	mg/L	40	50.46	48.66	99.7	95.2	87 - 112	3.63	15

METHOD BLANK: 2707321

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201737 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2302814001, 2302814003, 2302814004, 2302814005

METHOD BLANK: 2707886

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2707887

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	94.1	mg/L	1	0.94J	85 - 115

MATRIX SPIKE: 2707888 DUPLICATE: 2707889 ORIGINAL: 2302348003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	2.049	mg/L	6	7.876	7.956	97.1	98.5	85 - 115	1.01	20

MATRIX SPIKE: 2707890 DUPLICATE: 2707891 ORIGINAL: 2302814001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	5.77	mg/L	60	66.78	67.24	102	102	85 - 115	.69	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201738 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2302814006, 2302814007

METHOD BLANK: 2707892

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2707893

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	94.1	mg/L	1	0.94J	85 - 115

MATRIX SPIKE: 2707894 DUPLICATE: 2707895 ORIGINAL: 2302814007

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.262	mg/L	6	6.54	6.58	105	105	85 - 115	.61	20

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201772 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2302814001, 2302814003, 2302814004, 2302814005, 2302814006, 2302814007

METHOD BLANK: 2708215

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2708220 ORIGINAL: 2302654001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	93.71002	mg/L	88.48551	5.74	20

METHOD BLANK: 2708223

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708224 ORIGINAL: 2302654002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	84.82954	mg/L	85.60704	.91	20

METHOD BLANK: 2708227

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708228 ORIGINAL: 2302814001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Alkalinity, Total	196.13504	mg/L	200.7757	2.34	20

METHOD BLANK: 2708231

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708232 ORIGINAL: 2302818001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	139.54758	mg/L	133.6496	4.32	20

METHOD BLANK: 2708235

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708236 ORIGINAL: 2302825001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	57.80482	mg/L	54.82222	5.3	20

METHOD BLANK: 2708239

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708240 ORIGINAL: 2302938001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	226.3714	mg/L	241.91228	6.64	20

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708243

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708244 ORIGINAL: 2302938002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	475.97891	mg/L	468.74094	1.53	20

METHOD BLANK: 2708247

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708248 ORIGINAL: 2302938007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	66.30558	mg/L	67.44469	1.7	20

METHOD BLANK: 2708251

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2708252 ORIGINAL: 2303108001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	129.51073	mg/L	128.01349	1.16	20

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708255

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708256 ORIGINAL: 2303124001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	122.91826	mg/L	109.79333	11.3	20

METHOD BLANK: 2708259

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708260 ORIGINAL: 2303153001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	9.70008	mg/L	11.03795	12.9	20

METHOD BLANK: 2708263

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2708264 ORIGINAL: 2303153003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	12.07326	mg/L	10.40392	14.9	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2708943

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/201815 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2302814004

METHOD BLANK: 2708680

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2708681

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.7	mg/L	1	0.97J	85 - 115

MATRIX SPIKE: 2708682 DUPLICATE: 2708683 ORIGINAL: 2302248009

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.969	mg/L	6	8.075	8.128	102	103	85 - 115	.65	20

MATRIX SPIKE: 2708684 DUPLICATE: 2708685 ORIGINAL: 2302584008

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.406	mg/L	6	9.156	9.257	95.8	97.5	85 - 115	1.1	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2302814001	MW-26 031418			EPA 300.0	WETC/201686
2302814003	MW-24 031418			EPA 300.0	WETC/201686
2302814004	DUP-01 031418			EPA 300.0	WETC/201686
2302814005	MW-32 031418			EPA 300.0	WETC/201686
2302814006	MW-33 031418			EPA 300.0	WETC/201686
2302814007	MW-15 031418			EPA 300.0	WETC/201686
2302814001	MW-26 031418			S5310B-00	WETC/201737
2302814003	MW-24 031418			S5310B-00	WETC/201737
2302814005	MW-32 031418			S5310B-00	WETC/201737
2302814006	MW-33 031418			S5310B-00	WETC/201738
2302814007	MW-15 031418			S5310B-00	WETC/201738
2302814001	MW-26 031418			S2320B-97	WETC/201772
2302814003	MW-24 031418			S2320B-97	WETC/201772
2302814004	DUP-01 031418			S2320B-97	WETC/201772
2302814005	MW-32 031418			S2320B-97	WETC/201772
2302814006	MW-33 031418			S2320B-97	WETC/201772
2302814007	MW-15 031418			S2320B-97	WETC/201772
2302814004	DUP-01 031418			S5310B-00	WETC/201815
2302814001	MW-26 031418			RSK 175	SVGC/48589
2302814003	MW-24 031418			RSK 175	SVGC/48589
2302814004	DUP-01 031418			RSK 175	SVGC/48589
2302814005	MW-32 031418			RSK 175	SVGC/48589
2302814006	MW-33 031418			RSK 175	SVGC/48589
2302814007	MW-15 031418			RSK 175	SVGC/48589
2302814001	MW-26 031418			SW846 8260C	VOMS/46312

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2302814002	EB-1 031418			SW846 8260C	VOMS/46312
2302814003	MW-24 031418			SW846 8260C	VOMS/46312
2302814004	DUP-01 031418			SW846 8260C	VOMS/46312
2302814005	MW-32 031418			SW846 8260C	VOMS/46312
2302814006	MW-33 031418			SW846 8260C	VOMS/46312
2302814007	MW-15 031418			SW846 8260C	VOMS/46312

ALS Environmental
34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #: 7800 6295 3481

* 2302814 *

Co. Name: AECOM

Contact (Report to): John Santacroce Phone: 518 951 2208

Address: 40 British American BLVD
Latham, NY 12110

Bill to (If different than Report to): PO#: 60440641

Project Name/#: Scotia Navy Depot ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. Date Required:
[ ] Rush-Subject to ALS approval and surcharges. Approved By:

Email? [✓] -Y John.Santacroce@aecom.com

Fax? [ ] -Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	***Container Type	***Container Size	*** Preservative	8260C	RSK175	TOC	Alkalinity	Cl, SO4, NO3						Enter Number of Containers Per Analysis
						AG	AG	AG	P	P									
						40ml	40ml	40ml	250	250									
						HCl	H2SO4	HCl	0	0									
1 MW-26 031418	* Extra vol. MS/MSD	3/14/18	855	G	GW	x2	x2	x2	x3	x3									→ NC times
2 EB-1 031418		3/14/18	900	-	-	x2													SW3-19
3 MW-24 031418		3/14/18	1015	G	GW	x2	x2	x2	x2	x1									
4 DUP-01 031418	* Duplicate *	3/14/18	-	G	GW	x2	x2	x2	x2	x1									
5 MW-32 031418		3/14/18	1115	G	GW	x2	x2	x2	x2	x1									
6 MW-33 031418		3/14/18	1235	G	GW	x2	x2	x2	x2	x1									
7 MW-15 031418		3/14/18	1345	G	GW	x2	x2	x2	x2	x1									
8																			

Receipt Information (completed by Sample Receiving)
Performed by:
Cooler Temp: 2
Therm. ID: 3/8
No. of Coolers:
Notes:

Circle appropriate Y or N.	Container in good condition?	COC/Labels complete/accurate?	Received on ice?	(if present) Seals intact?	Custody seals Present?
N	N	N	N	N	N
Y	Y	Y	Y	Y	Y

Correct containers? Correct sample volume? Correct preservation? Headspace/Volatiles?

SAMPLED BY (Please Print): Ross McCready / Alex Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Ross McCready / AECOM	3/14/18		2 Brian McGuire / AECOM	3/14/18	2000
3 Brian McGuire	3/14/18	1700	4 [illegible]	3/15/18	1119
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other
EDDs Required? [ ] If yes, format type:
SDWA Forms? ⇨ yes [ ] yes [ ] yes [ ]
State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ] Other
DOD Criteria Required?

ALS FIELD SERVICES
[ ] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

March 27, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**2302386**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN031|Scotia Navy Depot**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, March 14, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. John Santacroce , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302386001	MW-16 031318	Ground Water	3/13/2018 11:22	3/14/2018 11:32	Collected by Client
2302386002	MW-35 031318	Ground Water	3/13/2018 12:35	3/14/2018 11:32	Collected by Client
2302386003	MW-34 031318	Ground Water	3/13/2018 13:49	3/14/2018 11:32	Collected by Client
2302386004	Trip Blank	Ground Water	3/14/2018 11:32	3/14/2018 11:32	Collected by Client

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302386 ASN031|Scotia Navy Depot

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386001** Date Collected: 3/13/2018 11:22 Matrix: Ground Water

Sample ID: **MW-16 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:32	CJG	C
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118			SW846 8260C			3/27/18 04:32	CJG	C
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			3/27/18 04:32	CJG	C
Dibromofluoromethane (S)	102		%	80 - 119			SW846 8260C			3/27/18 04:32	CJG	C
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C			3/27/18 04:32	CJG	C
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/19/18 03:57	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/19/18 03:57	EGO	A
Methane	0.25U	U,1	ug/L	0.50	0.25	0.13	RSK 175			3/19/18 03:57	EGO	A
WET CHEMISTRY												
Alkalinity, Total	295	2	mg/L	5	5	0.8	S2320B-97			3/20/18 06:33	MSA	H
Chloride	2.9		mg/L	2.0	0.50	0.16	EPA 300.0			3/15/18 06:51	CHW	G
Nitrate-N	1.6		mg/L	0.20	0.060	0.020	EPA 300.0			3/15/18 06:51	CHW	G
Sulfate	123		mg/L	2.0	0.50	0.20	EPA 300.0			3/15/18 06:51	CHW	G
Total Organic Carbon (TOC)	0.86J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386002** Date Collected: 3/13/2018 12:35 Matrix: Ground Water

Sample ID: **MW-35 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
Trichloroethene	21.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:55	CJG	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/27/18 04:55	CJG	B
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		3/27/18 04:55	CJG	B
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C		3/27/18 04:55	CJG	B
Toluene-d8 (S)	99.4		%	89 - 112			SW846 8260C		3/27/18 04:55	CJG	B
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/19/18 04:38	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/19/18 04:38	EGO	A
Methane	32.7		ug/L	0.50	0.25	0.13	RSK 175		3/19/18 04:38	EGO	A
WET CHEMISTRY											
Alkalinity, Total	171	1	mg/L	5	5	0.8	S2320B-97		3/20/18 07:31	MSA	H
Chloride	14.5		mg/L	2.0	0.50	0.16	EPA 300.0		3/15/18 07:07	CHW	G
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0		3/15/18 07:07	CHW	G
Sulfate	8.5		mg/L	2.0	0.50	0.20	EPA 300.0		3/15/18 07:07	CHW	G
Total Organic Carbon (TOC)	1.2		mg/L	1.0	0.50	0.18	S5310B-00		3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386003** Date Collected: 3/13/2018 13:49 Matrix: Ground Water

Sample ID: **MW-34 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
Trichloroethene	17.6		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:18	CJG	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/27/18 05:18	CJG	B
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C		3/27/18 05:18	CJG	B
Dibromofluoromethane (S)	96.7		%	80 - 119			SW846 8260C		3/27/18 05:18	CJG	B
Toluene-d8 (S)	99.9		%	89 - 112			SW846 8260C		3/27/18 05:18	CJG	B
LIGHT HYDROCARBON GASES											
Ethane	1.3		ug/L	1.0	0.50	0.25	RSK 175		3/19/18 04:53	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/19/18 04:53	EGO	A
Methane	1260		ug/L	0.50	0.25	0.13	RSK 175		3/19/18 04:53	EGO	A
WET CHEMISTRY											
Alkalinity, Total	174	1	mg/L	5	5	0.8	S2320B-97		3/20/18 07:41	MSA	H
Chloride	15.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/15/18 07:23	CHW	G
Nitrate-N	0.020J	J	mg/L	0.20	0.060	0.020	EPA 300.0		3/15/18 07:23	CHW	G
Sulfate	8.5		mg/L	2.0	0.50	0.20	EPA 300.0		3/15/18 07:23	CHW	G
Total Organic Carbon (TOC)	3.4		mg/L	1.0	0.50	0.18	S5310B-00		3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386004** Date Collected: 3/14/2018 11:32 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 01:53	CJG	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C			3/27/18 01:53	CJG	A
4-Bromofluorobenzene (S)	104		%	85 - 114	SW846 8260C			3/27/18 01:53	CJG	A
Dibromofluoromethane (S)	98		%	80 - 119	SW846 8260C			3/27/18 01:53	CJG	A
Toluene-d8 (S)	98.8		%	89 - 112	SW846 8260C			3/27/18 01:53	CJG	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302386001	1	MW-16 031318	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 200 and the upper control limit is 20.				
2302386001	2	MW-16 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302386002	1	MW-35 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302386003	1	MW-34 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

QC Batch: SVGC/48516 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2302386001, 2302386002, 2302386003

METHOD BLANK: 2706745

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.25U	ug/L	0.50

SAMPLE DUPLICATE: 2706746 ORIGINAL: 2302386001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	0	ug/L	.43	NC	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

QC Batch: VOMS/46312 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2302386001, 2302386002, 2302386003, 2302386004

METHOD BLANK: 2711286

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	104	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97.5	%	80 - 119
Toluene-d8 (S)	102	%	89 - 112

LABORATORY CONTROL SAMPLE: 2711287

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.3	72 - 136
1,1-Dichloroethane	100	ug/L	20	20.0	77 - 125
1,2-Dichloroethane	97.9	ug/L	20	19.6	73 - 128
1,1-Dichloroethene	111	ug/L	20	22.3	71 - 131
cis-1,2-Dichloroethene	96.7	ug/L	20	19.3	78 - 123
trans-1,2-Dichloroethene	108	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	96.5	ug/L	20	19.3	78 - 124
1,1,2,2-Tetrachloroethane	94.3	ug/L	20	18.9	71 - 121
Tetrachloroethene	101	ug/L	20	20.2	74 - 129
Toluene	102	ug/L	20	20.4	80 - 121
1,1,1-Trichloroethane	105	ug/L	20	20.9	74 - 131
1,1,2-Trichloroethane	95.4	ug/L	20	19.1	80 - 119
Trichloroethene	98.8	ug/L	20	19.8	79 - 123

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

Vinyl Chloride	100	ug/L	20	20.0	58 - 137
1,2-Dichloroethane-d4 (S)	98.8	%			81 - 118
4-Bromofluorobenzene (S)	99.9	%			85 - 114
Dibromofluoromethane (S)	95	%			80 - 119
Toluene-d8 (S)	97.4	%			89 - 112

MATRIX SPIKE: 2711288 DUPLICATE: 2711289 ORIGINAL: 2302814001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	21.8397	22.2235	109	111	72 - 136	1.74	30
1,1-Dichloroethane	0	ug/L	20	19.8483	20.7689	99.2	104	77 - 125	4.53	30
1,2-Dichloroethane	0	ug/L	20	19.1919	20.7097	96	104	73 - 128	7.61	30
1,1-Dichloroethene	0	ug/L	20	21.7959	22.6668	109	113	71 - 131	3.92	30
cis-1,2-Dichloroethene	0	ug/L	20	19.1956	20.3111	96	102	78 - 123	5.65	30
trans-1,2-Dichloroethene	0	ug/L	20	21.1856	22.2869	106	111	75 - 124	5.07	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	19.6971	20.3453	98.5	102	78 - 124	3.24	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	18.4568	19.2132	92.3	96.1	71 - 121	4.02	30
Tetrachloroethene	0	ug/L	20	20.2862	20.8551	101	104	74 - 129	2.77	30
Toluene	0	ug/L	20	20.1701	20.9252	101	105	80 - 121	3.67	30
1,1,1-Trichloroethane	0	ug/L	20	21.2263	21.9078	106	110	74 - 131	3.16	30
1,1,2-Trichloroethane	0	ug/L	20	19.3452	19.4187	96.7	97.1	80 - 119	.38	30
Trichloroethene	0	ug/L	20	19.7467	20.9011	98.7	105	79 - 123	5.68	30
Vinyl Chloride	0	ug/L	20	19.8249	21.647	99.1	108	58 - 137	8.79	30
1,2-Dichloroethane-d4 (S)	103	%				103	107	81 - 118		
4-Bromofluorobenzene (S)	98.2	%				98.2	101	85 - 114		
Dibromofluoromethane (S)	94.5	%				94.5	96.6	80 - 119		
Toluene-d8 (S)	96.2	%				96.2	96.2	89 - 112		

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

QC Batch: WETC/201602 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2302386001, 2302386002, 2302386003

METHOD BLANK: 2706208

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2706210

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	103	mg/L	20	20.5	87 - 111
Nitrate-N	100	mg/L	2.5	2.5	88 - 111
Sulfate	103	mg/L	20	20.7	87 - 112

METHOD BLANK: 2706213

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

QC Batch: WETC/201639 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2302386001, 2302386002, 2302386003

METHOD BLANK: 2706663

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706668 ORIGINAL: 2302367001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	282.26132	mg/L	259.57791	8.37	20

METHOD BLANK: 2706671

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706672 ORIGINAL: 2302462001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	53.95195	mg/L	53.89643	.1	20

METHOD BLANK: 2706675

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706676 ORIGINAL: 2302462005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

Alkalinity, Total	76.21419	mg/L	79.52512	4.25	20

METHOD BLANK: 2706679

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

METHOD BLANK: 2706683

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

METHOD BLANK: 2706687

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706688 ORIGINAL: 2302575002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	55.29454	mg/L	52.19287	5.77	20

METHOD BLANK: 2706691

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706692 ORIGINAL: 2302575003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	199.72171	mg/L	194.21478	2.8	20

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

METHOD BLANK: 2706695

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2706696 ORIGINAL: 2302584001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	140.21143	mg/L	142.31808	1.49	20

METHOD BLANK: 2706699

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

METHOD BLANK: 2707490

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2302386 ASN031|Scotia Navy Depot

QC Batch: WETC/201674 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2302386001, 2302386002, 2302386003

METHOD BLANK: 2707162

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2707163

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	94.1	mg/L	1	0.94J	85 - 115

MATRIX SPIKE: 2707164 DUPLICATE: 2707165 ORIGINAL: 2301889003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.605	mg/L	6	6.92	6.752	105	102	85 - 115	2.46	20

MATRIX SPIKE: 2707166 DUPLICATE: 2707167 ORIGINAL: 2302272003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.322	mg/L	6	9.153	9.147	97.2	97.1	85 - 115	.07	20

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2302386001	MW-16 031318			EPA 300.0	WETC/201602
2302386002	MW-35 031318			EPA 300.0	WETC/201602
2302386003	MW-34 031318			EPA 300.0	WETC/201602
2302386001	MW-16 031318			S2320B-97	WETC/201639
2302386002	MW-35 031318			S2320B-97	WETC/201639
2302386003	MW-34 031318			S2320B-97	WETC/201639
2302386001	MW-16 031318			RSK 175	SVGC/48516
2302386002	MW-35 031318			RSK 175	SVGC/48516
2302386003	MW-34 031318			RSK 175	SVGC/48516
2302386001	MW-16 031318			S5310B-00	WETC/201674
2302386002	MW-35 031318			S5310B-00	WETC/201674
2302386003	MW-34 031318			S5310B-00	WETC/201674
2302386001	MW-16 031318			SW846 8260C	VOMS/46312
2302386002	MW-35 031318			SW846 8260C	VOMS/46312
2302386003	MW-34 031318			SW846 8260C	VOMS/46312
2302386004	Trip Blank			SW846 8260C	VOMS/46312

ALS Environmental
34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #: 7800 3294 [illegible]

2302386

Co. Name: AECOM

Contact (Report to): John Santacroce Phone: (518)951-2200

Address: c/o British American Blvd
Latham, NY 12110

Bill to (if different than Report to):
Scotia, NY

PO#: 60440641

Project Name/#: Scotia Navy Depot

ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [✓] Y John.Santacroce@aecom.com

Fax? [ ] Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK175	TAC	Alkalinity	Cl, SO4, NO3									
***Container Type						VOA	VOA	VOA	P	P									
***Container Size						4mL	40mL	40mL	250	250									
*** Preservative						HCl	HCl	HCl	0	0									
1 MW-16 031318		3/13/18	1122	G	GW	X	X	X	X	X									
2 MW-35 031318		3/13/18	1235	G	GW	X	X	X	X	X									
3 MW-34 031318		3/13/18	1349	G	GW	X	X	X	X	X									
4 TRIP Blank		-	-	-	-	X													
5																			
6																			
7																			
8																			

Enter Number of Containers Per Analysis

(completed by Sample Receiving)

Performed by: SIGN HERE

Cooler Temp: 2

Therm. ID: 318

No. of Coolers:

Notes:

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
	N (Y)	N (Y)	N (Y)	N (Y)	
	(Y) N	(Y) N	(Y) N	(Y) N	N
	Y	Y	(Y) N	(Y) N	(Y) N

	Custody seals Present?	(if present) Seals intact?	Received on ice?	COC/Labels complete/accurate?	Container in good condition?
	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N

SAMPLED BY (Please Print): Ross McCurdy / Alex Golden

Project Comments: Same Deliverables as last time / See QAPP

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Ross McCurdy / AECOM	3/13/18	1405	2 B Hammerquist	3/13/18	1485
3 B Hammerquist	3/13/18	1700	4 [illegible]	3/14/18	1132
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other

EDDs Required? [ ] If yes, format type:

DOD Criteria Required?

SDWA Forms? ⇨ yes [ ] yes [ ] yes [ ]

State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]

Other

ALS FIELD SERVICES
[ ] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

APPENDIX E: AECOM Data Usability Summary Report (DUSR)

Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

Prepared by:
AECOM
Pittsburgh, PA
60440641-14
April 2018

April 2, 2018

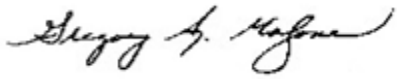
Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
March 2018
Final

Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

Prepared by:
AECOM
Pittsburgh, PA
60440641-14
April 2018

April 2, 2018

Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
March 2018
Final



Prepared By
Gregory Malzone, Project Chemist
AECOM
Gulf Tower
707 Grant Street, 5th floor
Pittsburgh, PA 15219

Reviewed By
Robert Davis, Data Validator/Database Technician
AECOM
1360 Peachtree Street NE, Suite 500
Atlanta, GA 30309

Contents

Executive Summary ES-1

1.0 Volatile Organic Compounds 1-1

2.0 Methane, Ethane, Ethene 2-1

3.0 Chloride, Sulfate, Nitrate as N 3-1

4.0 Alkalinity 4-1

5.0 Total Organic Carbon 5-1

6.0 Field Duplicate Comparison 6-1

7.0 Notes 7-1

List of Appendices

Appendix A Glossary of Data Qualifier Codes

Appendix B Data Qualification Summaries

Appendix C Support Documentation

Executive Summary

Overview

Data validation was performed by Gregory A. Malzone of AECOM-Pittsburgh on the fixed-laboratory analytical data for groundwater samples collected from the Defense National Stockpile Center Scotia Depot, Glenville, New York, on March 13-15, 2018. Samples were collected as part of the baseline groundwater sampling round as described in Final Quality Assurance Project Plan for the Defense National Stockpile Center Scotia Depot Glenville, New York (the project-specific QAPP; AECOM, September 2016). Samples were submitted for analysis to ALS Environmental, 34 Dogwood Lane, Middletown, Pennsylvania 17057.

The list of field and field quality control samples submitted, the date sampled and the laboratory work order numbers are presented in Table 1. Data were reported by ALS in three deliverables. Each laboratory deliverable is identified by both a laboratory work order number and sample delivery group (SDG) number.

The following analytical methods were requested on the chain-of-custody (CoC) records.

- Volatile Organic Compounds by USEPA SW-846 Method 8260C
- Methane, Ethane and Ethene by RSK -175
- Chloride, Nitrate as N and Sulfate by Method EPA Method 300.0
- Alkalinity by Standard Methods 2320B-97
- Total Organic Carbon by Standard Methods 5310B-00

The trip blank and equipment blank were analyzed for VOCs only. Sample MW-26-031418 was designated in the field to be processed as the quality control sample, that is, as the matrix spike/matrix spike duplicate (MS/MSD). Unless otherwise noted, analyses were performed in accordance with the project-specific QAPP which is based on the DoD QSM v5.0.

Table 1 - Sample Submittals

Field ID	ALS ID	Matrix	Field QC	Date Sampled	WO Number	SDG Number
MW-16-031318	2302386001	Groundwater		03/13/2018	2302386	ASN031
MW-35-031318	2302386002	Groundwater		03/13/2018	2302386	ASN031
MW-34-031318	2302386003	Groundwater		03/13/2018	2302386	ASN031
Trip Blank-031318	2302386004	Aqueous (QC)	trip blank	03/13/2018	2302386	ASN031
MW-26-031418	2302814001	Groundwater	MS/MSD	03/14/2018	2302814	ASN033
EB-1-031418	2302814002	Aqueous (QC)	equipment blank	03/14/2018	2302814	ASN033
MW-24-031418	2302814003	Groundwater		03/14/2018	2302814	ASN033
DUP-01-031418	2302814004	Groundwater (QC)	MW-32-031418	03/14/2018	2302814	ASN033
MW-32-031418	2302814005	Groundwater		03/14/2018	2302814	ASN033
MW-33-031418	2302814006	Groundwater		03/14/2018	2302814	ASN033
MW-15-031418	2302814007	Groundwater		03/14/2018	2302814	ASN033
MW-30-031518	2302803001	Groundwater		03/15/2018	2302803	ASN032
MW-31-031518	2302803002	Groundwater		03/15/2018	2302803	ASN032
MW-28-031518	2302803003	Groundwater		03/15/2018	2302803	ASN032
MW-29-031518	2302803004	Groundwater		03/15/2018	2302803	ASN032
DUP-02-031518	2302803005	Groundwater (QC)	MW-29-031518	03/15/2018	2302803	ASN032

The data were evaluated for conformance to method specifications and qualifiers were applied using the USEPA Region II SOPs and the validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, EPA-540-R-014-002, August 2014 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, EPA-540-R-013-001, August 2014, as they apply to the analytical methods employed.

Field duplicate relative percent difference (RPD) review and applicable control limits were taken from the *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, December 1996.

Summary

All data have been determined to be useable for the purpose of assessing the presence/absence and quantitative concentrations of the compounds and analytes in the media tested (i.e. groundwater) with the qualifications described below. Completeness of 100% was achieved for this data set. This is within the goal of 90-100% and is acceptable.

A glossary of data qualifier definitions is included in Appendix A of this report. The qualified data summaries are attached as Appendix B of this report.

Each nonconformance with specific data usability criteria is discussed below. Page references for the supporting documentation in the laboratory reports are provided in each item header. Support documentation for data qualifications was included in Appendix C of this report.

1.0 Volatile Organic Compounds

Measurement performance indicators which did not meet criteria for Volatile Organic Compounds (VOCs) analysis are presented below for each of the three laboratory reports. Analytical results for VOCs were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- GC/MS Tunes
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Trip Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicate
- Internal Standards
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2302386 (SDG ASN031)

No data quality issues were noted. No data qualification was required.

Work Order 2302803 (SDG ASN032)

Surrogate Recovery (p. 30): Samples MW-29-031518 and DUP-02-031518 required analysis at a five-fold dilution to bring the trichloroethane concentration into the calibration range. The surrogate toluene-d8 recovery for DUP-02-031518 was less than the lower quality control limit of 89%, at 83.8%. The *USEPA National Functional Guidelines* permit one nonconforming surrogate recovery per fraction (i.e., acid or base/neutral) so long as the recovery was greater than 10%. No data qualification was required.

Work Order 2302814 (SDG ASN033)

No data quality issues were noted. No data qualification was required.

2.0 Methane, Ethane, Ethene

Measurement performance indicators which did not meet criteria for methane, ethane, ethene (MEE) analysis are presented below for each of the three laboratory reports. Analytical results for MEE were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2302386 (SDG ASN031)

No data quality issues were noted. No data qualification was required.

Work Order 2302803 (SDG ASN032)

No data quality issues were noted. No data qualification was required.

Work Order 2302814 (SDG ASN033)

No data quality issues were noted. No data qualification was required.

3.0 Chloride, Sulfate, Nitrate as N

Measurement performance indicators which did not meet criteria for chloride, sulfate and nitrate as N analysis are presented below for each of the three laboratory reports. Analytical results for these anions were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2302386 (SDG ASN031)

No data quality issues were noted. No data qualification was required.

Work Order 2302803 (SDG ASN032)

No data quality issues were noted. No data qualification was required.

Work Order 2302814 (SDG ASN033)

Method Blanks (p. 1942): The method blank 2707280 analyzed on March 16, 2018 had a chloride result 0.16 J mg/L. All samples were affected. The chloride results for associated samples MW-15-031418, MW-26-031418, MW-24-031418, DUP-01-131418, MW-32-031418 and MW-33-031318 were greater than the Limit of quantitation (LOQ) and greater than ten times the blank level and did not require qualification.

4.0 Alkalinity

Measurement performance indicators which did not meet criteria for alkalinity analysis are presented below for each of the three laboratory reports. Analytical results for alkalinity were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2302386 (SDG ASN031)

Method Blanks (p. 1599): Alkalinity was detected in method blanks analyzed on March 20, 2018 at estimated concentrations 0f 3.0 J mg/L. The total alkalinity results for associated samples MW-16-031318, MW-34-031318 and MW-35-031318 were greater than the LOQ and greater than ten times blank levels and did not require qualification.

Work Order 2302803 (SDG ASN032)

Method Blanks (p. 4386): Alkalinity was detected in method blanks analyzed on March 22, 2018 at estimated concentrations ranging from 2-4 J mg/L. The total alkalinity results for associated samples MW-28-131518, MW-29-131518, DUP-02-031518, MW-30-031518 and MW-31-031518 were greater than the LOQ and greater than ten times the method blank levels. No data qualifications were required.

Work Order 2302814 (SDG ASN033)

Method Blanks (p. 1925): Alkalinity was detected in method blanks analyzed on March 22, 2018 at estimated concentrations ranging from 2-4 J mg/L. The total alkalinity results for associated samples MW-15-031418, MW-26-031418, MW-24-031418, DUP-01-131418, MW-32-031418 and MW-33-031318 were greater than the LOQ and greater than ten times the method blank levels. No data qualifications were required.

5.0 Total Organic Carbon

Measurement performance indicators which did not meet criteria for total organic carbon (TOC) analysis are presented below for each of the three laboratory reports. Analytical results for TOC were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2302386 (SDG ASN031)

No data quality issues were noted. No data qualification was required.

Work Order 2302803 (SDG ASN032)

No data quality issues were noted. No data qualification was required.

Work Order 2302814 (SDG ASN033)

No data quality issues were noted. No data qualification was required.

6.0 Field Duplicate Comparison

Field duplicate samples were collected at groundwater wells MW-29 and MW-32. See Tables 2A and 2B below for the calculated RPDs for all compounds for which there were detections. Field duplicate results were evaluated using the following criteria.

Organics: The RPD must be ≤ 30% for groundwaters, for results greater than or equal to two times the LOQ. If one of the results is non-detect or less than two times the LOQ, and the duplicate is greater than two times the LOQ, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Action applies only to the affected analyte in the organic duplicate sample pair.

Inorganics: The RPD must be ≤ 30% for groundwaters, for results greater than or equal to five times the LOQ. For results less than five times the reporting limit, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Action applies to the affected analyte in all inorganic samples of the same matrix prepared and analyzed by the same method.

The following notations are used in the field precision tables.

RPD: Relative percent difference
Qual: Qualification required
µg/L: micrograms per liter (ppb) and mg/L: milligrams per liter (ppm)
≤±2LOQ: The absolute difference between the parent and field duplicate results was less than two times the LOQ. Variation of this magnitude is acceptable.

Table 2A – Field Duplicate Precision

Parameter	Units	MW-32-031418	DUP-01-031418	RPD (%)	Qual
cis-1,2-Dichloroethene	µg/L	0.61 J	0.64 J	4.8	None
Trichloroethene	µg/L	104	106	1.9	None
Methane	µg/L	583	515	12	None
Ethane	µg/L	10.7	9.8	8.8	None
Ethene	µg/L	3.3	3.0	9.5	None
Alkalinity, total	mg/L	162	160	1.2	None
Chloride	mg/L	25.4	25.4	0	None
Sulfate	mg/L	7.1	7.0	1.4	None
Total Organic Carbon	mg/L	2.7	2.7	0	None

Table 2B – Field Duplicate Precision

Parameter	Units	MW-29-031518	DUP-02-031518	RPD (%)	Qual
Carbon Tetrachloride	µg/L	0.72 J	0.75 J	4.1	None
1,1-Dichloroethane	µg/L	0.91 J	0.96 J	5.3	None
1,1-Dichloroethene	µg/L	0.77 J	0.84 J	8.7	None
cis-1,2-Dichloroethene	µg/L	5.4	5.7	5.4	None
trans-1,2-Dichloroethene	µg/L	0.44 J	0.48 J	8.7	None
Tetrachloroethene	µg/L	38.9	40.0	2.8	None
1,1,1-Trichloroethane	µg/L	13.2	13.1	0.76	None
Trichloroethene	µg/L	207	207	0	None
Alkalinity, total	mg/L	360	356	1.1	None
Chloride	mg/L	23.4	22.9	2.2	None
Nitrate	mg/L	1.3	1.3	0	None
Sulfate	mg/L	15.0	15.0	0	None
Total Organic Carbon	mg/L	0.38 J	0.50 J	27	None

All parent and field duplicate results were within the advisory acceptance criteria. Field sampling/laboratory precision and sample homogeneity were acceptable. No data qualifications were required.

7.0 Notes

Positive organic and inorganic results less than the LOQ, but greater than the limit of detection (LOD) were qualified “J,” as estimated concentrations, due to increased uncertainty near the LOD. The “J” qualifiers were maintained in the data validation. Sample results reported between the LOD and LOQ are usable as estimated values with an unknown directional bias.

Matrix spike and matrix spike duplicates and laboratory duplicates that were performed on non-project samples were not evaluated because matrix similarity to project samples could not be assumed.

Appendix A

Glossary of Data Qualifier Codes

Glossary of Data Qualifier Codes

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

J The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, likely to be biased high. The associated numerical value is the approximate concentration of the analyte in the sample.

J- The result is an estimated quantity, likely to be biased low. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified.

N (Organics) The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.

NJ (Organics) The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

Appendix B

Data Qualification Summaries

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386001** Date Collected: 3/13/2018 11:22 Matrix: Ground Water

Sample ID: **MW-16 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 04:32	CJG	C
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118			SW846 8260C		3/27/18 04:32	CJG	C
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		3/27/18 04:32	CJG	C
Dibromofluoromethane (S)	102		%	80 - 119			SW846 8260C		3/27/18 04:32	CJG	C
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C		3/27/18 04:32	CJG	C
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/19/18 03:57	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/19/18 03:57	EGO	A
Methane	0.25U	U,1	ug/L	0.50	0.25	0.13	RSK 175		3/19/18 03:57	EGO	A
WET CHEMISTRY											
Alkalinity, Total	295	2	mg/L	5	5	0.8	S2320B-97		3/20/18 06:33	MSA	H
Chloride	2.9		mg/L	2.0	0.50	0.16	EPA 300.0		3/15/18 06:51	CHW	G
Nitrate-N	1.6		mg/L	0.20	0.060	0.020	EPA 300.0		3/15/18 06:51	CHW	G
Sulfate	123		mg/L	2.0	0.50	0.20	EPA 300.0		3/15/18 06:51	CHW	G
Total Organic Carbon (TOC)	0.86J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386002** Date Collected: 3/13/2018 12:35 Matrix: Ground Water

Sample ID: **MW-35 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
Trichloroethene	21.2		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 04:55	CJG	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C			3/27/18 04:55	CJG	B
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C			3/27/18 04:55	CJG	B
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C			3/27/18 04:55	CJG	B
Toluene-d8 (S)	99.4		%	89 - 112			SW846 8260C			3/27/18 04:55	CJG	B
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/19/18 04:38	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/19/18 04:38	EGO	A
Methane	32.7		ug/L	0.50	0.25	0.13	RSK 175			3/19/18 04:38	EGO	A
WET CHEMISTRY												
Alkalinity, Total	171	X	mg/L	5	5	0.8	S2320B-97			3/20/18 07:31	MSA	H
Chloride	14.5		mg/L	2.0	0.50	0.16	EPA 300.0			3/15/18 07:07	CHW	G
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0			3/15/18 07:07	CHW	G
Sulfate	8.5		mg/L	2.0	0.50	0.20	EPA 300.0			3/15/18 07:07	CHW	G
Total Organic Carbon (TOC)	1.2		mg/L	1.0	0.50	0.18	S5310B-00			3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386003** Date Collected: 3/13/2018 13:49 Matrix: Ground Water

Sample ID: **MW-34 031318** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
Trichloroethene	17.6		ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/27/18 05:18	CJG	B

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118	SW846 8260C			3/27/18 05:18	CJG	B
4-Bromofluorobenzene (S)	100		%	85 - 114	SW846 8260C			3/27/18 05:18	CJG	B
Dibromofluoromethane (S)	96.7		%	80 - 119	SW846 8260C			3/27/18 05:18	CJG	B
Toluene-d8 (S)	99.9		%	89 - 112	SW846 8260C			3/27/18 05:18	CJG	B

LIGHT HYDROCARBON GASES												
Ethane	1.3		ug/L	1.0	0.50	0.25	RSK 175			3/19/18 04:53	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/19/18 04:53	EGO	A
Methane	1260		ug/L	0.50	0.25	0.13	RSK 175			3/19/18 04:53	EGO	A
WET CHEMISTRY												
Alkalinity, Total	174	X	mg/L	5	5	0.8	S2320B-97			3/20/18 07:41	MSA	H
Chloride	15.4		mg/L	2.0	0.50	0.16	EPA 300.0			3/15/18 07:23	CHW	G
Nitrate-N	0.020J	J	mg/L	0.20	0.060	0.020	EPA 300.0			3/15/18 07:23	CHW	G
Sulfate	8.5		mg/L	2.0	0.50	0.20	EPA 300.0			3/15/18 07:23	CHW	G
Total Organic Carbon (TOC)	3.4		mg/L	1.0	0.50	0.18	S5310B-00			3/19/18 12:11	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID: **2302386004** Date Collected: 3/14/2018 11:32 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/14/2018 11:32

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 01:53	CJG	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C		3/27/18 01:53	CJG	A
4-Bromofluorobenzene (S)	104		%	85 - 114	SW846 8260C		3/27/18 01:53	CJG	A
Dibromofluoromethane (S)	98		%	80 - 119	SW846 8260C		3/27/18 01:53	CJG	A
Toluene-d8 (S)	98.8		%	89 - 112	SW846 8260C		3/27/18 01:53	CJG	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803001** Date Collected: 3/15/2018 08:30 Matrix: Ground Water

Sample ID: **MW-30 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
Trichloroethene	9.8		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:15	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/27/18 20:15	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		3/27/18 20:15	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/27/18 20:15	TMP	A
Toluene-d8 (S)	98		%	89 - 112			SW846 8260C		3/27/18 20:15	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	31.1		ug/L	1.0	0.50	0.25	RSK 175		3/26/18 02:18	EGO	C
Ethene	2.2		ug/L	1.5	0.75	0.31	RSK 175		3/26/18 02:18	EGO	C
Methane	5860		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 02:18	EGO	C
WET CHEMISTRY											
Alkalinity, Total	141	✗	mg/L	5	5	0.8	S2320B-97		3/22/18 06:47	MSA	H
Chloride	43.6		mg/L	2.0	0.50	0.16	EPA 300.0		3/17/18 07:45	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/17/18 07:45	CHW	G
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0		3/17/18 07:45	CHW	G
Total Organic Carbon (TOC)	50.9		mg/L	10.0	5.0	1.8	S5310B-00		3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803002** Date Collected: 3/15/2018 09:15 Matrix: Ground Water

Sample ID: **MW-31 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
cis-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
Trichloroethene	19.1		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 20:38	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118	SW846 8260C		3/27/18 20:38	TMP	A
4-Bromofluorobenzene (S)	101		%	85 - 114	SW846 8260C		3/27/18 20:38	TMP	A
Dibromofluoromethane (S)	99.6		%	80 - 119	SW846 8260C		3/27/18 20:38	TMP	A
Toluene-d8 (S)	99		%	89 - 112	SW846 8260C		3/27/18 20:38	TMP	A

LIGHT HYDROCARBON GASES											
Ethane	2.6		ug/L	1.0	0.50	0.25	RSK 175		3/26/18 02:34	EGO	C
Ethene	1.6		ug/L	1.5	0.75	0.31	RSK 175		3/26/18 02:34	EGO	C
Methane	34.4		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 02:34	EGO	C
WET CHEMISTRY											
Alkalinity, Total	143		mg/L	5	5	0.8	S2320B-97		3/22/18 06:56	MSA	H
Chloride	50.6		mg/L	2.0	0.50	0.16	EPA 300.0		3/17/18 08:01	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/17/18 08:01	CHW	G
Sulfate	6.7		mg/L	2.0	0.50	0.20	EPA 300.0		3/17/18 08:01	CHW	G
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803003** Date Collected: 3/15/2018 10:20 Matrix: Ground Water

Sample ID: **MW-28 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1-Dichloroethane	0.69J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
Tetrachloroethene	23.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1,1-Trichloroethane	5.6		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
Trichloroethene	153		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:01	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/27/18 21:01	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 21:01	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/27/18 21:01	TMP	A
Toluene-d8 (S)	99		%	89 - 112			SW846 8260C		3/27/18 21:01	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 02:50	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 02:50	EGO	C
Methane	0.25U	U	ug/L	0.50	0.25	0.13	RSK 175		3/26/18 02:50	EGO	C
WET CHEMISTRY											
Alkalinity, Total	360		mg/L	5	5	0.8	S2320B-97		3/22/18 07:07	MSA	H
Chloride	20.9		mg/L	2.0	0.50	0.16	EPA 300.0		3/17/18 08:17	CHW	G
Nitrate-N	1.5		mg/L	0.20	0.060	0.020	EPA 300.0		3/17/18 08:17	CHW	G
Sulfate	20.2		mg/L	2.0	0.50	0.20	EPA 300.0		3/17/18 08:17	CHW	G
Total Organic Carbon (TOC)	0.36J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803004** Date Collected: 3/15/2018 11:15 Matrix: Ground Water

Sample ID: **MW-29 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.72J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1-Dichloroethane	0.91J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1-Dichloroethene	0.77J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
cis-1,2-Dichloroethene	5.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
trans-1,2-Dichloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
Tetrachloroethene	38.9		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1,1-Trichloroethane	13.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
Trichloroethene	207		ug/L	5.0	3.8	1.7	SW846 8260C		3/28/18 18:43	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 21:23	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C		3/27/18 21:23	TMP	A
1,2-Dichloroethane-d4 (S)	100		%	81 - 118			SW846 8260C		3/28/18 18:43	TMP	B
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		3/28/18 18:43	TMP	B
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 21:23	TMP	A
Dibromofluoromethane (S)	96.5		%	80 - 119			SW846 8260C		3/28/18 18:43	TMP	B
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/27/18 21:23	TMP	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C		3/27/18 21:23	TMP	A
Toluene-d8 (S)	97.9		%	89 - 112			SW846 8260C		3/28/18 18:43	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 03:22	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 03:22	EGO	C
Methane	0.25U	U	ug/L	0.50	0.25	0.13	RSK 175		3/26/18 03:22	EGO	C
WET CHEMISTRY											
Alkalinity, Total	360		mg/L	5	5	0.8	S2320B-97		3/22/18 07:19	MSA	H
Chloride	23.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/17/18 08:32	CHW	G
Nitrate-N	1.3		mg/L	0.20	0.060	0.020	EPA 300.0		3/17/18 08:32	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0		3/17/18 08:32	CHW	G
Total Organic Carbon (TOC)	0.38J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302803005** Date Collected: 3/15/2018 00:00 Matrix: Ground Water

Sample ID: **DUP-02 031518** Date Received: 3/16/2018 10:55

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1-Dichloroethane	0.96J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1-Dichloroethene	0.84J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
cis-1,2-Dichloroethene	5.7		ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
trans-1,2-Dichloroethene	0.48J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
Tetrachloroethene	40.0		ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1,1-Trichloroethane	13.1		ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
Trichloroethene	207		ug/L	5.0	3.8	1.7	SW846 8260C		3/29/18 17:46	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/28/18 19:06	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		3/28/18 19:06	TMP	A
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/29/18 17:46	DD	A
4-Bromofluorobenzene (S)	90.1		%	85 - 114			SW846 8260C		3/29/18 17:46	DD	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		3/28/18 19:06	TMP	A
Dibromofluoromethane (S)	96		%	80 - 119			SW846 8260C		3/28/18 19:06	TMP	A
Dibromofluoromethane (S)	91.3		%	80 - 119			SW846 8260C		3/29/18 17:46	DD	A
Toluene-d8 (S)	98.8		%	89 - 112			SW846 8260C		3/28/18 19:06	TMP	A
Toluene-d8 (S)	83.8	2'	%	89 - 112			SW846 8260C		3/29/18 17:46	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 03:56	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 03:56	EGO	C
Methane	0.25U	U	ug/L	0.50	0.25	0.13	RSK 175		3/26/18 03:56	EGO	C
WET CHEMISTRY											
Alkalinity, Total	356	1'	mg/L	5	5	0.8	S2320B-97		3/22/18 08:18	MSA	H
Chloride	22.9		mg/L	2.0	0.50	0.16	EPA 300.0		3/17/18 08:48	CHW	G
Nitrate-N	1.3		mg/L	0.20	0.060	0.020	EPA 300.0		3/17/18 08:48	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0		3/17/18 08:48	CHW	G
Total Organic Carbon (TOC)	0.50J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814001** Date Collected: 3/14/2018 08:55 Matrix: Ground Water

Sample ID: **MW-26 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 05:41	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/27/18 05:41	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		3/27/18 05:41	CJG	A
Dibromofluoromethane (S)	99.3		%	80 - 119			SW846 8260C		3/27/18 05:41	CJG	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C		3/27/18 05:41	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 00:21	EGO	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 00:21	EGO	A
Methane	26.6		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 00:21	EGO	A
WET CHEMISTRY											
Alkalinity, Total	196	X	mg/L	5	5	0.8	S2320B-97		3/22/18 08:07	MSA	P
Chloride	32.3		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 07:02	CHW	M
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 07:02	CHW	M
Sulfate	10.6		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 07:02	CHW	M
Total Organic Carbon (TOC)	5.8J	J	mg/L	10.0	5.0	1.8	S5310B-00		3/20/18 19:01	PAG	G

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814002** Date Collected: 3/14/2018 09:00 Matrix: Ground Water

Sample ID: **EB-1 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 02:39	CJG	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118	SW846 8260C		3/27/18 02:39	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C		3/27/18 02:39	CJG	A
Dibromofluoromethane (S)	99.1		%	80 - 119	SW846 8260C		3/27/18 02:39	CJG	A
Toluene-d8 (S)	100		%	89 - 112	SW846 8260C		3/27/18 02:39	CJG	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814003** Date Collected: 3/14/2018 10:15 Matrix: Ground Water

Sample ID: **MW-24 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
Trichloroethene	2.0		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:04	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/27/18 06:04	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		3/27/18 06:04	CJG	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/27/18 06:04	CJG	A
Toluene-d8 (S)	99.3		%	89 - 112			SW846 8260C		3/27/18 06:04	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 00:36	EGO	C
Ethene	1.0J	J	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 00:36	EGO	C
Methane	927		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 00:36	EGO	C
WET CHEMISTRY											
Alkalinity, Total	313		mg/L	5	5	0.8	S2320B-97		3/22/18 08:40	MSA	H
Chloride	60.8		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 07:50	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 07:50	CHW	G
Sulfate	0.22J	J	mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 07:50	CHW	G
Total Organic Carbon (TOC)	44.1		mg/L	25.0	12.5	4.6	S5310B-00		3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814004** Date Collected: 3/14/2018 00:00 Matrix: Ground Water

Sample ID: **DUP-01 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
cis-1,2-Dichloroethene	0.64J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Trichloroethene	106		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:26	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/27/18 06:26	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 06:26	CJG	A
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C		3/27/18 06:26	CJG	A
Toluene-d8 (S)	99.5		%	89 - 112			SW846 8260C		3/27/18 06:26	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	9.8		ug/L	1.0	0.50	0.25	RSK 175		3/26/18 00:53	EGO	C
Ethene	3.0		ug/L	1.5	0.75	0.31	RSK 175		3/26/18 00:53	EGO	C
Methane	515		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 00:53	EGO	C
WET CHEMISTRY											
Alkalinity, Total	160	✗	mg/L	5	5	0.8	S2320B-97		3/22/18 08:50	MSA	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 08:05	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 08:05	CHW	G
Sulfate	7.0		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 08:05	CHW	G
Total Organic Carbon (TOC)	2.7		mg/L	1.0	0.50	0.18	S5310B-00		3/21/18 12:51	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814005** Date Collected: 3/14/2018 11:15 Matrix: Ground Water

Sample ID: **MW-32 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
cis-1,2-Dichloroethene	0.61J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
Trichloroethene	104		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 06:49	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/27/18 06:49	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 06:49	CJG	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/27/18 06:49	CJG	A
Toluene-d8 (S)	99.7		%	89 - 112			SW846 8260C		3/27/18 06:49	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	10.7		ug/L	1.0	0.50	0.25	RSK 175		3/26/18 01:30	EGO	C
Ethene	3.3		ug/L	1.5	0.75	0.31	RSK 175		3/26/18 01:30	EGO	C
Methane	583		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 01:30	EGO	C
WET CHEMISTRY											
Alkalinity, Total	162	✗	mg/L	5	5	0.8	S2320B-97		3/22/18 09:00	MSA	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 08:21	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 08:21	CHW	G
Sulfate	7.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 08:21	CHW	G
Total Organic Carbon (TOC)	2.7		mg/L	1.0	0.50	0.18	S5310B-00		3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814006** Date Collected: 3/14/2018 12:35 Matrix: Ground Water

Sample ID: **MW-33 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:12	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C		3/27/18 07:12	CJG	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		3/27/18 07:12	CJG	A
Dibromofluoromethane (S)	101		%	80 - 119			SW846 8260C		3/27/18 07:12	CJG	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C		3/27/18 07:12	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 01:46	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 01:46	EGO	C
Methane	6.1		ug/L	0.50	0.25	0.13	RSK 175		3/26/18 01:46	EGO	C
WET CHEMISTRY											
Alkalinity, Total	215	✗	mg/L	5	5	0.8	S2320B-97		3/22/18 09:10	MSA	H
Chloride	23.0		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 08:37	CHW	G
Nitrate-N	0.34		mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 08:37	CHW	G
Sulfate	11.6		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 08:37	CHW	G
Total Organic Carbon (TOC)	0.83J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID: **2302814007** Date Collected: 3/14/2018 13:45 Matrix: Ground Water

Sample ID: **MW-15 031418** Date Received: 3/15/2018 11:19

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
Tetrachloroethene	0.88J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1,1-Trichloroethane	3.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
Trichloroethene	87.8		ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/27/18 07:35	CJG	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118			SW846 8260C		3/27/18 07:35	CJG	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		3/27/18 07:35	CJG	A
Dibromofluoromethane (S)	99.7		%	80 - 119			SW846 8260C		3/27/18 07:35	CJG	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C		3/27/18 07:35	CJG	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/26/18 02:02	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/26/18 02:02	EGO	C
Methane	0.18J	J	ug/L	0.50	0.25	0.13	RSK 175		3/26/18 02:02	EGO	C
WET CHEMISTRY											
Alkalinity, Total	223	✗	mg/L	5	5	0.8	S2320B-97		3/22/18 09:21	MSA	H
Chloride	24.0		mg/L	2.0	0.50	0.16	EPA 300.0		3/16/18 08:52	CHW	G
Nitrate-N	0.70		mg/L	0.20	0.060	0.020	EPA 300.0		3/16/18 08:52	CHW	G
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0		3/16/18 08:52	CHW	G
Total Organic Carbon (TOC)	0.26J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/20/18 19:01	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

Appendix C

Support Documentation

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302386 ASN031|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302386001	MW-16 031318	Ground Water	3/13/2018 11:22	3/14/2018 11:32	Collected by Client
2302386002	MW-35 031318	Ground Water	3/13/2018 12:35	3/14/2018 11:32	Collected by Client
2302386003	MW-34 031318	Ground Water	3/13/2018 13:49	3/14/2018 11:32	Collected by Client
2302386004	Trip Blank	Ground Water	3/14/2018 11:32	3/14/2018 11:32	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier:
Tracking #: 7800 3294 :12

2302386

Co. Name: AECOM
Contact (Report to): John Santacroce
Phone: (518)951-2200
Address: 40 British American BLVD, Latham, NY 12110

Bill to (if different than Report to): Scotia, NY
PO#: 60440641

Project Name/#: Scotia Navy Depot
ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:

Email? ✓ Y John.Santacroce@aecom.com
Fax? Y No:

***Container Type	VOA	VOA	VOA	P	P
***Container Size	40mL	40mL	40mL	250	250
**Preservative	HCl	2	2	0	0

ANALYSES/METHOD REQUESTED

	Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK175	TOC	Alkalinity	Cl, SO4, NO3
1	MW-16 031318		3/13/18	1122	G	GW	X	X	X	X	X
2	MW-35 031318		3/13/18	1235	G	GW	X	X	X	X	X
3	MW-34 031318		3/13/18	1349	G	GW	X	X	X	X	X
4	TRIP Blank		–	–	–	–	X				
5											
6											
7											
8											

Enter Number of Containers Per Analysis

(completed by Sample Receipt)
Performed by: [initials]
Cooler Temp: 2
Therm. ID: 318
No. of Coolers:
Notes:

Circle appropriate Y or N.

Correct containers?	Y
Correct sample volume?	Y
Correct preservation?	Y
Headspace/Volatiles?	N
Custody seals Present?	Y
(if present) Seals intact?	/
Received on ice?	Y
COC/Labels complete/accurate?	Y
Container in good condition?	Y

SAMPLED BY (Please Print): Ross McCrady / Alex Golden

Project Comments: Same Deliverables as last time / See QAPP

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	Ross McCrady / AECOM	3/13/18	1405	2	Bryan McGuirk	3/13	1405
3	Bryan McGuirk	3/13/18	1700	4	[signature]	3/14	1132
5				6			
7				8			
9				10			

Data Deliverables: [✓] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
EDDs Required? [ ] If yes, format type:
SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other
State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]
DOD Criteria Required?

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
Rev 01-2013

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302386 ASN031|Scotia Navy Depot

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302386001	1	MW-16 031318	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 200 and the upper control limit is 20.				
2302386001	2	MW-16 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302386002	1	MW-35 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302386003	1	MW-34 031318	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-031 (2302386)

Sample Management

This report contains the results of the analysis of four (4) ground water samples collected on March 13-14, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on March 14, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Four (4) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Continuing Calibration Verification samples were analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Three (3) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Duplicate Samples. A duplicate sample, identified as 2706746, from project sample 2302386001. Target analytes were detected as follows:

- Methane was detected at 0.43 µg/L in the duplicate sample.

Anions by EPA 300.0

Sample handling. Three (3) aqueous samples were analyzed for chloride, nitrate-N, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Neither nitrate nor sulfate were detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 2706210 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Three (3) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis. Total alkalinity and pH standards were analyzed initially and throughout the analysis. The standards were recovered within the alkalinity QC limits of 90-110% and the pH QC limits of +/- 0.05 pH units.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. Three (3) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were not performed on any samples from this data deliverable.

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN031

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2706663	Alkalinity, Total	MB	QC-Water	03/20/2018 04:09	3	J	mg/L
2706671	Alkalinity, Total	MB	QC-Water	03/20/2018 07:00	3	J	mg/L
2706675	Alkalinity, Total	MB	QC-Water	03/20/2018 09:00	3	J	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302803001	MW-30 031518	Ground Water	3/15/2018 08:30	3/16/2018 10:55	Collected by Client
2302803002	MW-31 031518	Ground Water	3/15/2018 09:15	3/16/2018 10:55	Collected by Client
2302803003	MW-28 031518	Ground Water	3/15/2018 10:20	3/16/2018 10:55	Collected by Client
2302803004	MW-29 031518	Ground Water	3/15/2018 11:15	3/16/2018 10:55	Collected by Client
2302803005	DUP-02 031518	Ground Water	3/15/2018 00:00	3/16/2018 10:55	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F.717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Courier:

Tracking #: 7400 8521 5564

* 2 3 0 2 8 0 3 *

Co. Name: AECOM

Contact (Report to): Phone: 518 951 2200

Address: 40 British American BLVD
Latham, NY

Bill to (if different than Report to): AECOM
John Santacroce

PO#: 60440641

Project Name/#: Scotia Navy Dept

ALS Quote #:

TAT: ☑ Normal-Standard TAT is 10-12 business days! ☐ Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? ☑ Y John.Santacroce@aecom.com

Fax? ☐ Y No.:

Container Type	AG	AG	AG	P	P
Container Size	4oz	9oz	1L	250	250
Preservative	1	1	1	6	6

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	TOC	RSK175	Alkalinity	Cl, SO4, NO3	Enter Number of Containers Per Analysis				
1 MW-30 031518		3/15/18	830	G	GW	2	2	2	1	1					
2 MW-31 031518		3/15/18	915	G	GW	2	2	2	1	1					
3 MW-28 031518		3/15/18	1020	G	GW	2	2	2	1	1					
4 MW-29 031518		3/15/18	1115	G	GW	2	2	2	1	1					
5 DUP-02 031518	* Duplicate *	3/15/18	-	G	GW	2	2	2	1	1					
6															
7															
8															

Receipt Information (completed by Sample Receiving)

Preserved by: Bottle Type

Cooler Temp: 3

Therm. ID: 318

No. of Coolers:

Notes:

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
	Y N	Y N	Y N	Y N	

	Custody seals Present?	(if present) Seals intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
	Y N	Y N	Y N	Y N	Y N

SAMPLED BY (Please Print): Ros McCready / Alek Golden

Project Comments: 3/19/18 1617

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Ros McCready / AECOM	3/15/18		2 Bruce MacGuire	3/15/18	1215
3 Bruce MacGuire	3/15/18	1700	4 Saint Nn	3/16	1035
5			6		
7			8		
9			10		

Data Deliverables: ☑ Standard ☐ CLP-like ☐ NJ-Reduced ☐ NJ-Full ☐ EDDs Required? ☐ If yes, format type:

SDWA Format? yes

State Samples Collected In? MD NJ NY PA

Other SEE QAPP

DOD Criteria Required? SEE QAPP

ALS FIELD SERVICES: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-032 (2302803)

Sample Management

This report contains the results of the analysis of five (5) ground water samples collected on March 15, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on March 16, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Five (5) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Continuing Calibration Verification samples were analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits, except as follows:

- In 2414128 LCS, 2414127 MB and 2302803005, DL5, Toluene-d8 was recovered below control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 2706955 LCS, Carbon Tetrachloride was recovered below control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Five (5) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Duplicate Samples. A duplicate sample, identified as 2710614, from project sample 2302803003. Target analytes were not detected in the sample or in the duplicate.

Anions by EPA 300.0

Sample handling. Five (5) aqueous samples were analyzed for chloride, nitrate-N, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Neither nitrate nor sulfate were detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 2707278 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Five (5) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis. Total alkalinity and pH standards were analyzed initially and throughout the analysis. The standards were recovered within the alkalinity QC limits of 90-110% and the pH QC limits of +/- 0.05 pH units.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. Five (5) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses identified as 2708694 and 2708695 were performed on sample 2302803003 (MW-28 031518). All recoveries were within QC criteria.

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302803 ASN032|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302803001	1	MW-30 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803002	1	MW-31 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803003	1	MW-28 031518	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 200 and the upper control limit is 20.				
2302803003	2	MW-28 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803004	1	MW-29 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803005	1	DUP-02 031518	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302803005	2	DUP-02 031518	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 83.8 and the control limits were 89 to 112. This result was reported at a dilution of 5.				

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: ASN-032

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
02	2714128(LCS)	89.8	89.9	98.6	82.3 *	1
03	2714127(MB)	89.8	88.6	102	83.8 *	1
04	DUP-02 031518	90.1	91.3	106	83.8 *	1

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-032

Laboratory Control Spike - Sample No: 2706955

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		14.3	71.6*	(80-120)
1,1-Dichloroethane	20		19.6	98	(80-120)
1,2-Dichloroethane	20		19.7	98.6	(80-120)
1,1-Dichloroethene	20		20.1	100	(80-120)
cis-1,2-Dichloroethene	20		19.9	99.6	(80-120)
trans-1,2-Dichloroethen	20		20.6	103	(80-120)
1,1,1,2-Tetrachloroetha	20		17.6	88	(80-120)
1,1,2,2-Tetrachloroetha	20		19.9	99.7	(80-120)
Tetrachloroethene	20		21.7	108	(80-120)
Toluene	20		21.0	105	(80-120)
1,1,1-Trichloroethane	20		20.6	103	(80-120)
1,1,2-Trichloroethane	20		19.6	98.2	(80-120)
Trichloroethene	20		20.0	100	(80-120)
Vinyl Chloride	20		17.7	88.6	(80-120)

ICV, CCV acceptable; not used to qualify data
GAH 04/16/18

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 1 out of 14 outside limits

Comments: _____

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN032

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2708215	Alkalinity, Total	MB	QC-Water	03/22/2018 02:00	4	J	mg/L
2708223	Alkalinity, Total	MB	QC-Water	03/22/2018 05:07	3	J	mg/L
2708227	Alkalinity, Total	MB	QC-Water	03/22/2018 07:46	2	J	mg/L
2708231	Alkalinity, Total	MB	QC-Water	03/22/2018 10:05	3	J	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2302814001	MW-26 031418	Ground Water	3/14/2018 08:55	3/15/2018 11:19	Collected by Client
2302814002	EB-1 031418	Ground Water	3/14/2018 09:00	3/15/2018 11:19	Collected by Client
2302814003	MW-24 031418	Ground Water	3/14/2018 10:15	3/15/2018 11:19	Collected by Client
2302814004	DUP-01 031418	Ground Water	3/14/2018 00:00	3/15/2018 11:19	Collected by Client
2302814005	MW-32 031418	Ground Water	3/14/2018 11:15	3/15/2018 11:19	Collected by Client
2302814006	MW-33 031418	Ground Water	3/14/2018 12:35	3/15/2018 11:19	Collected by Client
2302814007	MW-15 031418	Ground Water	3/14/2018 13:45	3/15/2018 11:19	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #: 7800 6295 3481

* 2 3 0 2 8 1 4 *

Co. Name: AECOM

Contact (Report to): John Santacroce Phone: 518 951 2206

Address: 40 British American BLVD, Latham, NY 12110

Bill to (if different than Report to): PO#: 60448641

Project Name/#: Scotia Navy Depot ALS Quote #:

TAT: ☑ Normal-Standard TAT is 10-12 business days. ☐ Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? ☑ Y John.Santacroce@aecom.com

Fax? ☐ Y No.:

					***Container Type	AG	AG	AG	P	P	
					***Container Size	40ml	40ml	40ml	250	250	
					***Preservative	HCl	HCl	HCl	0	0	
					ANALYSES/METHOD REQUESTED	8260C	RSK175	TOC	Alkalinity	Cl, SO4, NO3	
Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	Enter Number of Containers Per Analysis					
1 MW-26 031418	* Extra vol. MS/MSD	3/14/18	855	G	GW	x2	x2	x2	x1	x1	→ 3 times, RW 3-19
2 FB-1 031418		3/14/18	900	-	-	x2					
3 MW-24 031418		3/14/18	1015	G	GW	x2	x2	x2	x1	x1	
4 DUP-01 031418	* Duplicate *	3/14/18	-	G	GW	x2	x2	x2	x1	x1	
5 MW-32 031418		3/14/18	1115	G	GW	x2	x2	x2	x1	x1	
6 MW-33 031418		3/14/18	1235	G	GW	x2	x2	x2	x1	x1	
7 MW-15 031418		3/14/18	1345	G	GW	x2	x2	x2	x1	x1	
8											

Receipt Information (completed by Sample Receiving)

Performed by: (initials)

Cooter Temp: 2

Therm. ID: 313

No. of Coolers:

Notes:

Circle appropriate Y or N.

Correct containers?	(Y)	N
Correct sample volume?	(Y)	N
Correct preservation?	(Y)	N
Headspace/Volatiles?	Y	(N)
Custody seals Present?	Y	N
(if present) Seals Intact?	Y	N
Received on ice?	(Y)	N
COC/Labels complete/accurate?	Y	(N)
Container in good condition?	(Y)	N

SAMPLED BY (Please Print): Ross McCready / Alex Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Ross McCready AECOM	3/14/18		2 Brian McAuliffe	3/14/18	1700
3 Brian McAuliffe	3/14/18	1700	4 [illegible]	3/15/18	1119
5			6		
7			8		
9			10		

Data Deliverables: ☑ Standard ☐ CLP-like ☐ NJ-Reduced ☐ NJ-Full ☐ ☐ If yes, format type: Other

EDDs Required?

DOD Criteria Required?

SDWA Forms? yes ☐ yes ☐ yes ☐ yes ☐

State Samples Collected In? MD ☐ NJ ☐ NY ☐ PA ☐

ALS FIELD SERVICES: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY Rev 01-2013

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2302814 ASN033|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2302814001	1	MW-26 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814003	1	MW-24 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814004	1	DUP-01 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814005	1	MW-32 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814006	1	MW-33 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2302814007	1	MW-15 031418	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-033 (2302814)

Sample Management

This report contains the results of the analysis of seven (7) ground water samples collected on March 14, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on March 15, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Seven (7) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Continuing Calibration Verification samples were analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples.

Matrix and Matrix Spike samples. Target analytes were recovered within control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Six (6) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Duplicate Samples. A duplicate sample, identified as 2710613, from project sample 2302814004. Target analytes were detected as follows:

Methane.....515.....and.....518..... µg/l in the sample and duplicate respectively.
Ethene.....3.0.....and... .. .3.1....
Ethane.....9.8.... and.....10.1

.

Anions by EPA 300.0

Sample handling. Six (6) aqueous samples were analyzed for chloride, nitrate-N, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 2707282 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate identified as 2707318 and 2707319 were performed on sample 2302814001 (MW-26 031418). All recoveries were within QC limits.

Total Alkalinity by SM 2320B

Sample handling. Six (6) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis. Total alkalinity and pH standards were analyzed initially and throughout the analysis. The standards were recovered within the alkalinity QC limits of 90-110% and the pH QC limits of +/- 0.05 pH units.

Duplicate. A duplicate analysis identified as 2708228 was performed on sample 2302814001 (MW-26 031418). The relative percent difference between the results was within the QC limit of 20%.

Total Organic Carbon by SM 5310B

Sample handling. Six (6) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were performed on sample 2302814001 (MW-26 031418). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

Matrix spike and matrix spike duplicate analyses were performed on sample 2302814007 (MW-15 031418). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-7

SDG No.: ASN033

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2707280	Chloride	MB	QC-Water	03/16/2018 05:13	0.16	J	mg/L
2707280	Nitrate-N	MB	QC-Water	03/16/2018 05:13	0.030	U	mg/L
2707280	Sulfate	MB	QC-Water	03/16/2018 05:13	0.25	U	mg/L
2707321	Chloride	MB	QC-Water	03/16/2018 09:55	0.25	U	mg/L
2707321	Nitrate-N	MB	QC-Water	03/16/2018 09:55	0.030	U	mg/L
2707321	Sulfate	MB	QC-Water	03/16/2018 09:55	0.25	U	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN033

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2708227	Alkalinity, Total	MB	QC-Water	03/22/2018 07:46	2	J	mg/L
2708231	Alkalinity, Total	MB	QC-Water	03/22/2018 10:05	3	J	mg/L
2708215	Alkalinity, Total	ICB	QC-Water	03/22/2018 02:00	4	J	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: S5310B-00
Instrument: TOC

SDG No.: ASN033

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2707886	Total Organic Carbon (TOC)	MB	QC-Water	03/20/2018 19:01	1.0	U	mg/L
2707892	Total Organic Carbon (TOC)	MB	QC-Water	03/20/2018 19:01	1.0	U	mg/L
2708680	Total Organic Carbon (TOC)	MB	QC-Water	03/21/2018 12:51	1.0	U	mg/L
ICB 1	Total Organic Carbon (TOC)	ICB	QC-Water	03/21/2018 12:51	1.0	U	mg/L
CCB 1	Total Organic Carbon (TOC)	CCB	QC-Water	03/21/2018 12:51	1.0	U	mg/L
CCB 2	Total Organic Carbon (TOC)	CCB	QC-Water	03/21/2018 12:51	1.0	U	mg/L
ICB 1	Total Organic Carbon (TOC)	ICB	QC-Water	03/20/2018 19:01	1.0	U	mg/L
CCB 8	Total Organic Carbon (TOC)	CCB	QC-Water	03/20/2018 19:01	0.051	J	mg/L
CCB 9	Total Organic Carbon (TOC)	CCB	QC-Water	03/20/2018 19:01	1.0	U	mg/L
CCB 10	Total Organic Carbon (TOC)	CCB	QC-Water	03/20/2018 19:01	1.0	U	mg/L

LOD = 5. mg/L Not used to quantify data

GAM 04/24/18.

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

APPENDIX F: Groundwater Concentration Trend Plots

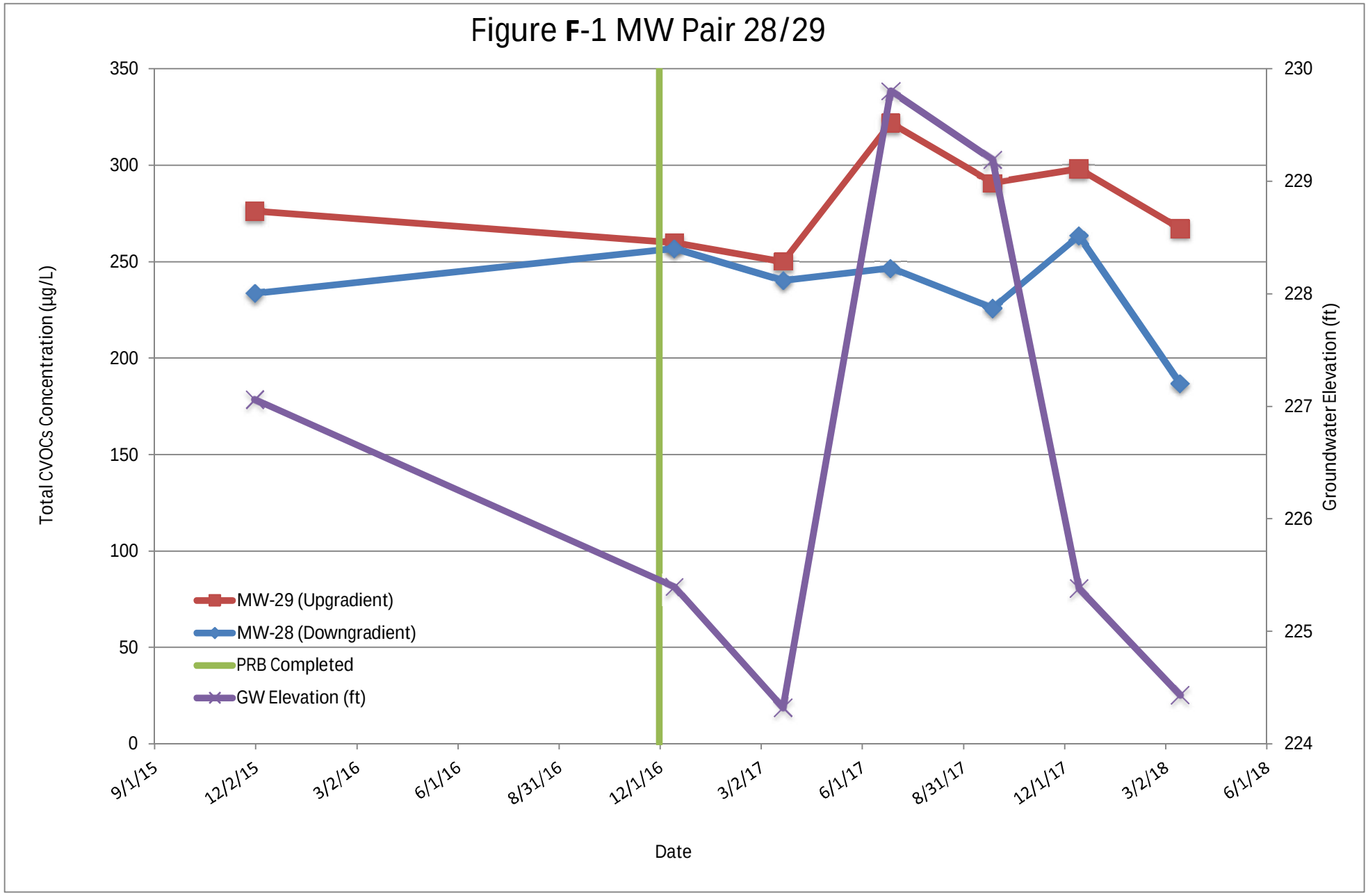


Figure F-1 MW Pair 28/29
Total CVOCs Concentration (µg/L)
Groundwater Elevation (ft)
Date
350
300
250
200
150
100
50
0
230
229
228
227
226
225
224
9/1/15
12/2/15
3/2/16
6/1/16
8/31/16
12/1/16
3/2/17
6/1/17
8/31/17
12/1/17
3/2/18
6/1/18
MW-29 (Upgradient)
MW-28 (Downgradient)
PRB Completed
GW Elevation (ft)

Figure F-2 MW Pair 30/31

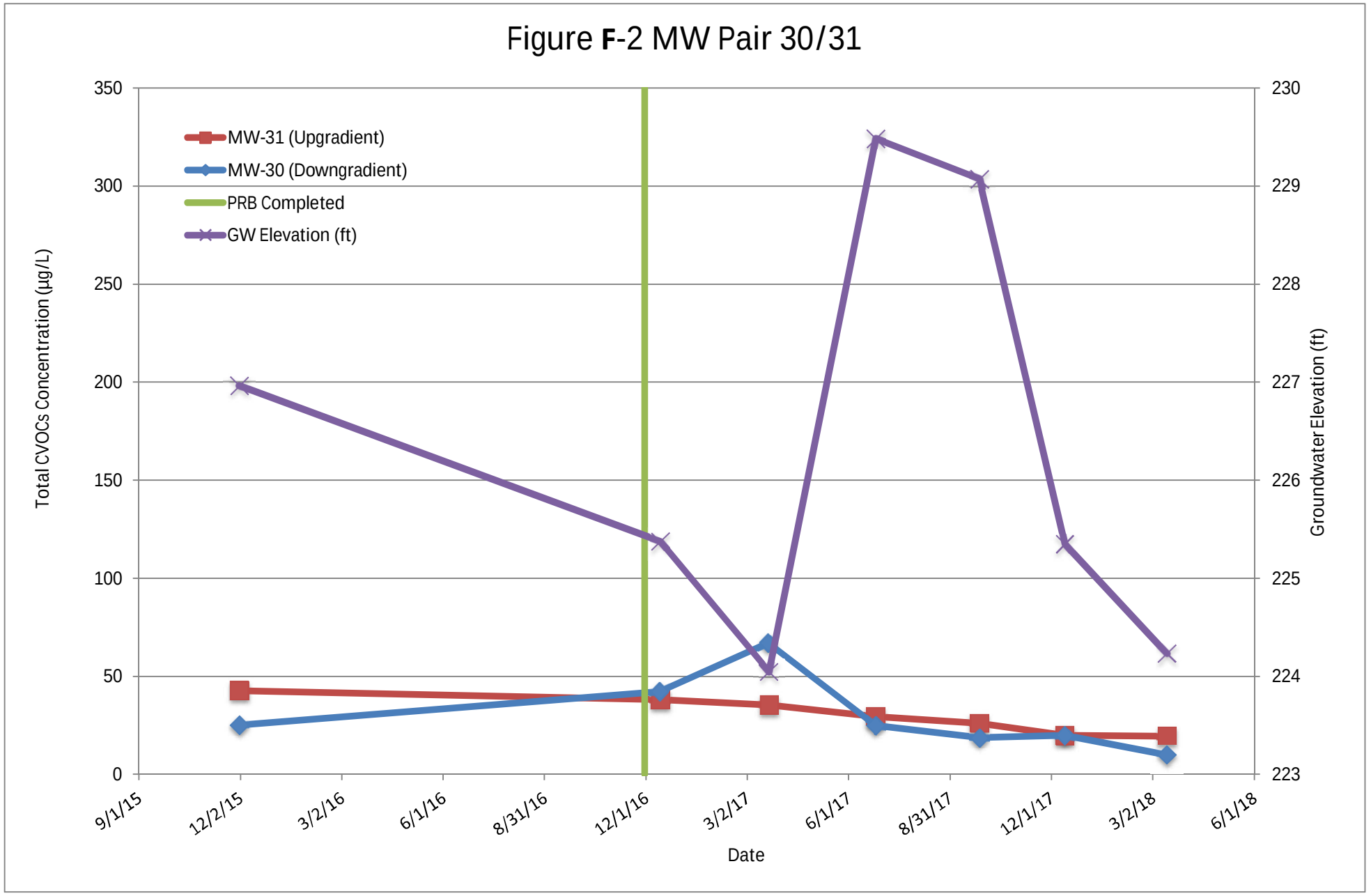


Figure F-3 MW Pair 32/33

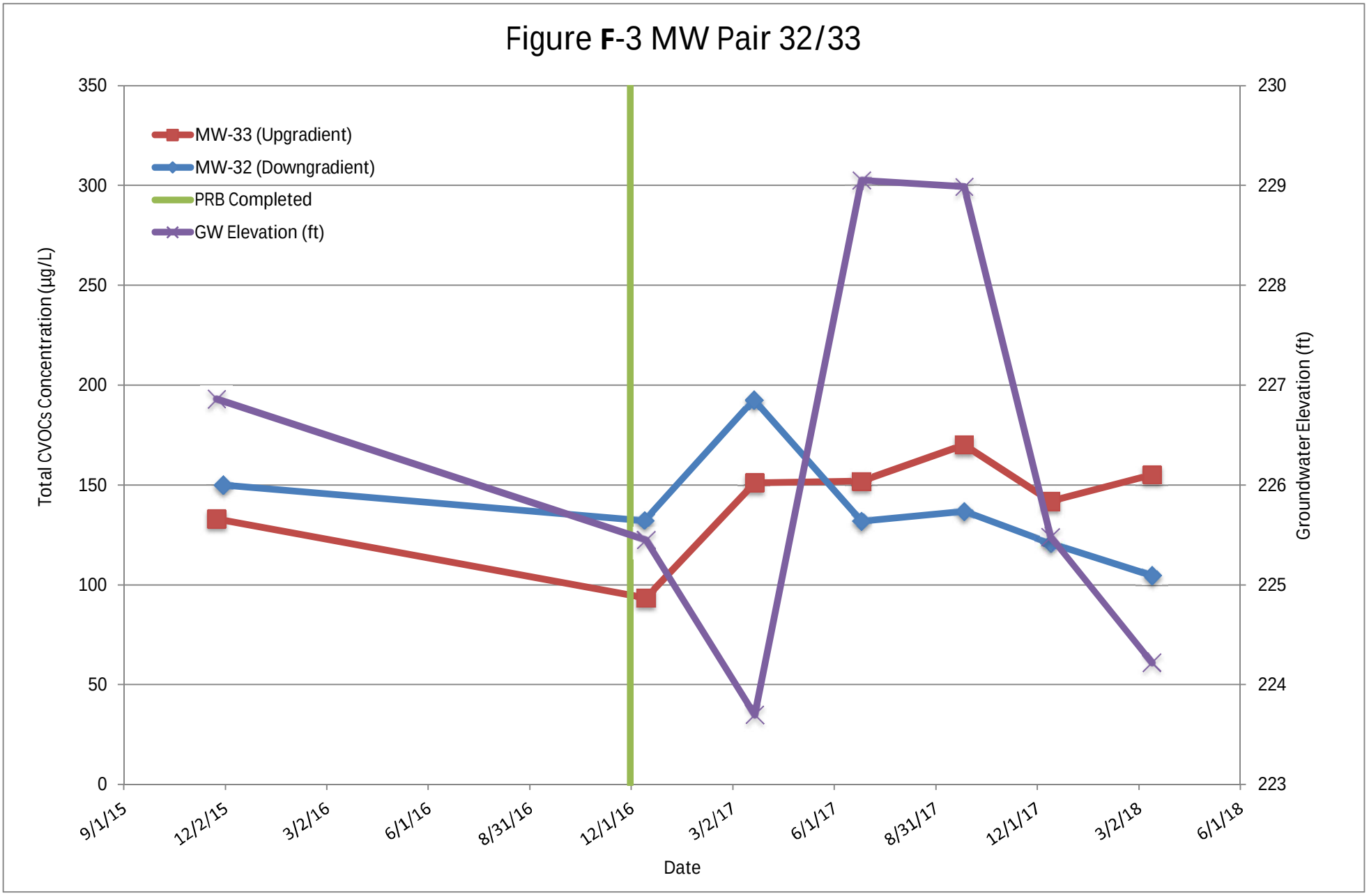


Figure **F**-4 MW Pair 34/35